THE MARINE REVIEW

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CUNARD LINE'S ANNUAL REPORT.

Evidence that the much-discussed falling off in trans-Atlantic travel during the last three months of 1907 did not affect the earnings of the Cunard Steamship Co., was furnished in the annual report for the year ended Dec. 31, 1907, issued recently. The gross earnings amounted to $12,496,371, compared with $11,350,080 for the previous year, while its operating expenses involved $9,722,400, compared with $8,584,115 in 1906, and its net earnings reached $2,773,971, as against $2,765,965 in the year previous.

Income derived from sources other than the operation of its trans-Atlantic lines, involved $23,515, compared with $20,400 for the previous years, making the total income $2,797,486, compared with $2,786,365 for 1906. As the company had a previous surplus of $272,055, compared with only $36,425 for 1906, its total gross surplus amounted to $3,069,541, compared with only $2,822,790 for the year previous. Depreciation charges, however, reached $1,798,400 as against $1,098,910 for the previous year, while income, taxes and insurance involved $321,725, compared with $201,820 for the preceding year, leaving a balance available for dividends amounting to $949,416, compared with $1,522,060 for 1906. Dividend disbursements involved $400,005, the same amount as for the previous year, leaving a net surplus of $549,411, compared with $272,055 for 1906. There were, however, no appropriations in 1907 for reserve and insurance funds, although in 1906 there was appropriated $250,000 for the reserve fund and $600,000 for the insurance fund.

The balance sheet showed government advances to the company during 1907, amounting to £2,615,807, compared with £1,999,004 for the previous year, and bankers' acceptances against new ships involving £785,000, compared with £660,000 for 1906. The company also stated that it issued 2,600,000 of 2¾ per cent debentures to the government to protect the latter's advance.

The book value of he company's fleet of steamships is stated at £6,003,664, of which £1,527,051 was paid for new ships in 1907, compared with £3,481,657 for 1906. At this rate, the expenditures for new ships in 1907, amounted to $122.73 a ton on 245,613 tons, including the tonnage of the steamships Lusitania and Mauretania.

CANADIAN TUG BARTLETT.

The tug steamer Bartlett, built at the Grangemouth yard of the Greenock & Grangemouth Dock Yard Co., Ltd., ran her trials in the Firth of Forth recently. The Bartlett is a powerful tug steamer of the Canadian type, dimensions 125 ft. B. P. x 25 ft. x 14 ft. molded, having triple expansion engines of 1,000 H. P., supplied with steam by large boiler working under Howden's forced draft She is equipped with powerful salvage plant for rendering assistance in case of accidents to vessels, and has also steam windlass, steam steering gear, complete equipment of electric light, steam warping capstan, steam heating throughout, with the special accommodation in the matter of saloon, cabins, galley and ice house as usual in Canadian-owned vessels. The machinery has been constructed by Messrs. Muir & Houston, Ltd., Kinning Park, Glasgow, and worked throughout the trial with perfect smoothness to the satisfaction of owners' representative and the builders. The Bartlett was loaded to her working trim, and attained a speed of 13 knots. Her maneuvering qualities were also thoroughly tested.

She has been built to the order of the Montreal Transportation Co., Ltd., of Montreal, under the superintendence of Mr. Dunlop, of Messrs. John Reid & Co., of Glasgow, London and New York, to whose designs she has been built. After the trial trip and adjustment of compasses, the Bartlett returned to Grangemouth to complete coaling for the voyage to Montreal. She will be commanded by Capt. Kerr.

MARINE INSURANCE—COLLISION WITH TOW.

The United States district court for the southwestern district of New York held, in the case of the Coastwise Steamship Co. vs. Aetna Insurance Co. et al., that a clause in a marine insurance policy providing that if the ship insured should come into collision with any other vessel, and the insured should become liable to pay, and should pay, any sum for damages resulting to such other vessel, the insuring company should contribute toward the payment of a certain proportion of the damages, did not cover injuries to a third vessel in tow for which the injured vessel was held partly responsible in a collision action, there being no contact except with the towed vessel, but was limited to injuries received by the insured vessel.

The new package freighters Burlington and Bennington, built at the Ecorse yard of the Great Lakes Enginering Works for the Rutland Transit Co., successfully passed through their trials recently and were delivered to their owners. The Burlington went to Cleveland for a cargo and the Bennington to Ogdensburg.

Commerce of Lake Superior

It has frequently been stated in the columns of the MARINE REVIEW that there is no adequate measure of the port to port commerce of the great lakes, and therefore no way of determining the total commerce of the great chain of waters. However, it is fair to assume that more than half of the commerce of the lakes passes through the canals at Sault Ste. Marie, and it is fortunate indeed that records at this point are very reliably kept by the officials in charge of the United States and Canadian canals. Supt. Louis C. Sabin has just submitted to Lieut. Col. C. McD. Townsend for transmission to the secretary of war the exhaustive report of canal commerce for 1907 that is known as the mile-ton report. The report shows that $38,457,345 was paid as carrying charges to vessels that moved 58,217,214 net tons of freight through the canals in 1907, and that the total value of freight was $569,830,188. The cost per ton per mile of moving this freight was 0.80 of a mill, as against 0.84 of a mill in 1906, as against 0.85 of a mill in 1905, 0.81 of a mill in 1904, 0.92 of a mill in 1903, and 0.89 of a mill in 1902.

The total freight traffic of 58,217,214 net tons for the season of 1907 when compared with the season of 1906 shows an increase of 12 per cent or 6,466,134 tons. The items showing an increase are coal, flour, wheat and iron ore. The total number of passengers was 62,758, a decrease of 275. Vessel passages through both canals numbered 20,437, showing a loss of 1,718 or 8 per cent. The total lockages numbered 14,020, a loss of 503 or 3 per cent. The season of navigation continued for a period of 7 months and 23 days, during which time the average monthly freight traffic was 7,338,305 net tons.

The traffic through the American canal was 73 per cent of the total freight and 52 per cent of the total number of passengers carried, the amounts being 42,631,846 tons of freight and 32,875 passengers. Compared with the season of 1906 there was a decrease of 2,548,446 tons of freight or 6 per cent, and an increase of 1,950 passengers, or 6 per cent. The American canal opened April 23 and closed Dec. 11, 1907, making the length of the season 233 days.

The traffic through the Canadian canal was 27 per cent of the total freight and 48 per cent of the passengers carried, the amounts being 15,585,368 tons of freight and 29,883 passengers. Compared with the season of 1906 there was an increase of 9,014,580 tons of freight, or 137 per cent, and a decrease of 2,225 passengers, or 7 per cent. The Canadian canal was opened April 22 and closed Dec. 15, 1907, making the length of its season 238 days.

Total freight carried, tons	58,217,214
Total net registered tons	44,087,974
Total mile-tons	48,221,465,547
Total valuation placed on freight carried	$569,830,188
Total amount paid for freight transportation	$38,457,345
Total number of registered vessels using canals	879
Total number of passages by unregistered crafts carrying freight	346
Total valuation placed on registered vessels	$110,443,500
Total number of passengers transported	62,758
Average distance freight was carried, miles	828.3
Average cost per ton for freight transportation	$0.66
Average cost per mile per ton, mills	.80
Average value per ton of freight carried	$9.79
Time American canal was operated, days	233
Time Canadian canal was operated, days	238
Freight carried by—	
Registered vessels, tons	58,186,957
Unregistered vessels, tons	30,257
American vessels, per cent	95
Canadian vessels, per cent	5
Passengers carried by—	
American vessels, per cent	43
Canadian vessels, per cent	57
Average number of vessels passing per day—	
Through Poe lock	36
Weitzel lock	26
Canadian lock	27
Poe, Weitzel and Canadian locks	86

The number of registered vessels of 600 ft. and over in length using the canal in trade to and from Lake Superior was 4; of 500 to 600 ft. in length, 70; of 400 to 500 ft. in length, 141; of 300 to 400 ft. in length, 177; of 200 to 300 ft. in length, 247; of 100 to 200 ft. in length, 150; of less than 100 ft. in length, 10. The maximum freight traffic for a single day was on Aug. 26, when 487,649 tons passed through the canals on 121 vessels, having an aggregate registered tonnage of 287,385. Forty-three new vessels were put in commission for the Lake Superior trade in 1907. They were all steamships for freight traffic. Twenty-five of these new vessels are 500 ft. or more in length and carry from 9,000 to 13,800 net tons of freight in a single cargo. The largest single cargo carried through the canals in 1907 consisted of 13,800 tons on the steamer J. Pierpont Morgan. The greatest amount of freight carried was 339,151 tons by the steamer J. Pierpont Morgan. The greatest number of miles run were 43,296 by the steamer J. Pierpont Morgan, while the greatest number of mile-tons was 274,863,249 by the steamer Augustus B. Wolvin. The following table will prove interesting as showing the distribution to other lakes of freight bound eastward from Lake Superior and also the district from which freight bound to Lake Superior originated:

EAST BOUND.	
From Lake Superior ports to—	
Lake Michigan ports	4,567,018
Lake Huron ports	1,357,745
Lake Erie ports	38,955,071
Lake Ontario ports	664,485
Total	45,544,319
WEST BOUND.	
To Lake Superior from—	
Lake Michigan ports	118,406
Lake Huron ports	361,191
Lake Erie ports	12,048,987
Lake Ontario ports	144,311
Total	12,672,895

Comparative statement of commerce through the canals at Sault Ste. Marie, Michigan and Ontario, for the seasons of 1906 and 1907:

ITEMS—	—Traffic for 1907— United States Canal	Canadian Canal	—Total Traffic for— Season 1907	Season 1906
Vessel Passages—				
Steamers, Number	11,398	5,847	17,245	18,138
Sailing, Number	2,084	219	2,303	2,817
Unregistered, Number	609	280	889	1,200
Total, Number	14,091	6,346	20,437	22,155
Lockages, Number	9,428	4,592	14,020	14,523
Tonnage—				
Registered, Net	32,001,110	12,086,864	44,087,974	41,098,324
Freight, Net	42,631,846	15,585,368	58,217,214	51,751,080
Passengers, Number	32,875	29,883	62,758	63,033
Coal—				
Hard, Net tons	1,261,428	245,240	1,506,668	1,011,375
Soft, Net tons	7,636,668	2,256,759	9,893,427	7,728,255
Flour, Barrels	3,406,322	3,118,448	6,524,770	6,495,350
Wheat, Bushels	48,842,276	49,293,499	98,135,775	84,271,358
Grain, other than wheat, Bushels	21,040,692	22,422,646	43,463,338	54,343,155
Manufactured and pig iron, Net tons	203,398	104,543	307,941	391,105
Salt, Barrels	389,843	70,959	460,802	468,162
Copper, Net tons	74,302	15,657	89,959	107,633
Iron ore, Net tons	29,521,033	10,073,911	39,594,944	35,357,042
Lumber, M. ft. B. M.	600,714	48,606	649,320	900,631
Silver ore, Net tons	.....	.....	.....	.....
Building stone, Net tons	678	220	898	6,222
General merchandise, Net tons	524,897	497,757	1,022,654	1,134,851

Estimated value of total freight passing the canals at Sault Ste. Marie, Michigan and Ontario, for the season of 1907.

ITEMS—	Quantity	Price per Unit	Valuation
Coal, anthracite ..... Net tons	1,506,668	$ 5.80	$ 8,738,674
Coal, bituminous ..... Net tons	9,893,427	2.60	25,722,910
Flour ..... Barrels	6,524,770	5.00	32,623,850
Wheat ..... Bushels	98,135,775	1.00	98,135,775
Grain, other than wheat ..... Bushels	43,463,338	0.83	36,074,571
Iron ore ..... Net tons	39,594,944	3 75	148,481,040
Manufactured iron ..... Net tons	287,535	80.00	23,002,800
Pig iron ..... Net tons	20,406	23.25	474,440
Copper (refined and concentrates) ..... Net tons	89,959	310.00	27,887,290
Lumber ..... M. ft. B. M.	649,320	23.00	14,934,360
Salt ..... Barrels	460,802	0.75	345,602
Silver ore ..... Net tons	.....	.....	.....
Building stone ..... Net tons	898	12.00	10,776
General merchandise ..... Net tons	1,022,654	150.00	153,398,100
Totals			$569,830,188

In connection with the foregoing table there is also the following summary of relative values of the different commodities passing through the canals:

	Per cent.
Coal (anthracite and bituminous)	6.05
Cereals (wheat, rye, oats, corn, barley, flax and flour)	29.28
Iron ore	26.06
Iron (manufactured and pig iron)	4.12
Copper (refined and concentrates)	4.89
Lumber	2.62
All other products	26.98
	100.00

The American canal records show that vessels necessarily spent 27,003 hours and 40 minutes in canal, or an average of 2 hours 9 minutes, which includes time waiting for lockage and passage through locks and canal, the latter being 1 3-5 miles long. Other delays at canal, which included taking on supplies, waiting for daylight or favorable weather, amounted to 6,544 hours and 21 minutes. Delays to vessels due to operating railway swing bridge amounted to 25 minutes. Trains were delayed 23 hours and 53 minutes by passing boats temporarily preventing the closing of bridge. The aggregate time the railway swing bridge was swung across the canal amounted to 747 hours and 8 minutes, during which time 3,502 engines, 5,605 passenger cars and 25,071 freight cars crossed the bridge.

Table showing total freight, its valuation, freight charges, average haul or distance freight was carried, and rate per ton per mile.

Year.	Total Freight Net Tons	Valuation of Freight	Freight Charges	Average Haul	Freight Charges per Mile-Ton	Value of American Craft	Value of Canadian Craft
				Miles	Mills		
1887.....	5,494,649	$ 79,031,757	$10,075,153	811.4	2.3	$17,684,550	$2,089,400
1888.....	6,411,423	82,156,019	7,883,077	806.4	1.5	20,381,100	1,514,300
1889.....	7,516,022	83,732,527	8,634,246	790.4	1.5	25,328,600	1,597,600
1890.....	9,041,213	102,214,948	9,472,214	797.2	1.3	27,857,700	1,777,800
1891.....	8,888,759	128,178,208	9,849,022	820.4	1.35	31,947,300	2,119,500
1892.....	11,214,333	135,117,267	12,072,850	822.4	1.31	36,220,100	2,108,700
1893.....	10,796,572	145,436,957	9,957,483	831.9	1.1	39,017,400	2,115,700
1894.....	13,195,860	143,114,502	10,798,310	821.1	0.99	41,124,200	1,959,800
1895.....	15,062,580	159,575,129	14,238,758	830.0	1.14	40,858,800	2,037,000
1896.....	16,239,061	195,146,842	13,511,615	836.4	0.99	43,006,200	2,135,300
1897.....	18,982,755	218,235,927	13,220,099	841.3	0.83	42,375,700	2,001,400
1898.....	21,234,664	233,069,740	14,125,896	842.6	0.79	45,199,800	2,491,900
1899.....	25,255,810	281,364,750	21,959,707	827.2	1.05	65,000,520	3,369,600
1900.....	25,643,073	267,041,959	24,953,314	825.9	1.18	66,116,583	3,618,576
1901.....	28,403,065	289,906,865	23,217,974	823.3	0.99	57,244,200	3,311,900
1902.....	35,961,146	358,306,300	26,566,300	827.4	0.89	67,205,000	3,792,400
1903.....	34,674,437	349,405,014	26,727,735	835.6	0.92	68,252,800	6,384,500
1904.....	31,546,106	334,502,686	21,552,894	843.5	0.81	63,789,300	5,377,100
1905.....	44,270,680	416,965,484	31,420,585	833.3	0.85	73,211,300	5,429,000
1906.....	51,751,080	537,463,454	36,666,889	842.4	0.84	88,392,000	6,140,500
1907.....	58,217,214	569,830,188	38,457,345	828.3	0.80	102,525,500	7,918,000

Transportation charges, including loading and unloading, on freight passing through canals at Sault Ste. Marie, Michigan and Ontario, for the season of 1907:

ARTICLES—	Quantity.	Rate per unit.	Amount.
Coal ..... Net tons	11,400,095	$0.31	$ 3,534,029.45
Flour ..... Barrels	6,524,770	0.20	1,304,954.00
Wheat ..... Bushels	98,135,775	0.019	1,864,579.73
Grain, other than wheat ..... Bushels	43,463,338	0.019	825,803.42
Manufactured iron ..... Net tons	287,535	1.80	517,563.00
Pig iron ..... Net tons	20,406	1.50	30,609.00
Salt ..... Barrels	460,802	0.12	55,296.24
Copper ..... Net tons	89,959	1.40	125,942.60
Iron ore ..... Net tons	39,594,944	0.67	26,528,612.48
Lumber ..... M. ft. B. M.	649,320	2.50	1,623,300.00
Silver ore ..... Net tons	.....	....	.....
Building stone ..... Net tons	898	1.50	1,347.00
General merchandise ..... Net tons	1,022,654	2.00	2,045,308.00
Total			$38,457,344.92

Appended to this report is a calculation of the commerce passing through the Detroit river. While there is no means of obtaining the actual statistics of freight actually carried through the Detroit river, the government engineers have succeeded in approximating it by calculating the proportion of freight tonnage to registered tonnage. Both the registered and freight tonnage of the Sault Ste. Marie canals are known, and as the vessels which traverse the Detroit river are the same ones that pass through St. Marys Falls canal, it is comparatively simple to approximate freight tonnage of the Detroit river. The report of the Detroit river traffic is as follows:

The number and class of vessels and the number of passages have been taken from the customs house and postoffice records at Detroit. The registered tonnage is taken from the American and Canadian "blue books." The determination of the actual freight carried is based upon the assumption that the ratio between actual freight and registered tonnage is the same for Detroit river that it is for St. Marys Falls canals. The valuation of the freight is based upon the assumption that the value of the freight passing the Detroit river is the same per ton as that passing St. Marys Falls canals. The valuation of the vessels was taken from Lloyds Register and Great Lakes Register.

The commerce of the Detroit river during the past six years exceeds that of the St. Marys Falls canal by about 27 per cent.

The following compilation has been made from data similar to those used since 1902, viz., the marine postoffice record of vessels passing through the Detroit river and the customs house records of vessels stopping at Detroit. The Detroit postmaster, Homer Warren, has permitted the record of vessels passing Detroit to be copied, while the record of those stopping was obtained from the collectors of customs at Detroit, Windsor and Amherstburg. After the lists were completed the net registered tonnage was copied from the American and Canadian "blue books" and summed. The ferry boats plying between Detroit, Windsor and Belle Isle and the dredging plants at Amherstburg and Detroit are not included.

The passages are collected and summed as follows:

1907.	Vessels. No. of.	Net Registered Tonnage.
January	24	832
February	2	40
March	92	12,491
April	1,862	2,199,114
May	4,301	6,732,725
June	4,708	7,906,561
July	4,807	7,267,140
August	4,958	7,950,903
September	4,587	7,520,306
October	4,598	7,998,348
November	3,496	5,360,150
December	714	1,011,159
Total	34,149	53,959,769

The actual freight is obtained by comparison with the tonnage of St.

Marys Falls canal where records of both net registered and actual freight are kept. During the season of 1907 the actual freight passing St. Marys Falls canal was 32 per cent greater than the net registered tonnage. Assuming this ratio for the commerce of Detroit river the actual freight would be 71,226,895 tons of 2,000 lbs. each. The commerce using the St. Clair Flats canal is less than that of the Detroit river. It is found from the customs house records that 3,768,737 net registered tons that used the Detroit river do not go through the canal but turn around and go back down the river. This should be subtracted from the Detroit river tonnage. There is a small amount of business done at Lake St. Clair ports which does not go through the Detroit river, of which we have no actual record, but which is estimated by the custodian to aggregate 15,000 net registered tons during the season. This should be added to the Detroit river tonnage. Making the corrections, the commerce using the St. Clair Flats canal during the season of 1907, is found to be 50,206,032 net registered tons, or 66,271,962 actual freight tons. The value of the freight passing St. Marys Falls canal during the season of 1907 was found to be $9.79 per ton. Assuming this unit value of the Detroit river commerce, then the total value of actual freight passing Detroit river during the season of 1907 would be $697,311,302. The commerce passing Detroit river has now been determined with accuracy for six consecutive years as follows:

Year.	No. of Passages.	Net Registered Tons.	Actual Freight.	Value.
1902	33,000	39,328,689	44,260,506	$440,834,640
1903	33,113	37,453,796	46,817,245	471,917,830
1904	29,472	33,049,984	42,792,326	453,598,656
1905	35,599	45,912,622	55,508,360	522,888,751
1906	35,128	50,673,897	63,808,571	662,971,053
1907	34,149	53,959,769	71,226,895	697,311,302

The actual freight is 7,418,324 tons greater than in 1906. The number of vessel passages has decreased 979. There were 902 steam vessels that used the Detroit river during the season of 1907, of these there were 794 the registered tonnage of which exceeded 100 tons. The average tonnage of these 794 large steam vessels was 2,077 net registered tons. There were 277 sail vessels having a tonnage greater than 100 tons. Their tonnage was 914 tons.

GENERAL SUMMARY FOR DETROIT RIVER.

Total net registered tons	53,959,769
Actual freight carried	71,226,895
Valuation placed on freight	$697,311,302
Total number of vessels	1,215
Number of American vessels	1,070
Number of Canadian vessels	145
Number of steam vessels	902
Number of sail vessels	313
Valuation of steam vessels	$111,371,000
Valuation of sail vessels	$7,486,500
Total valuation of vessels	$118,857,500

ST. CLAIR FLATS CANAL.

Total net registered tons	50,206,032
Actual freight	66,271,962

COMMERCE OF SAULT STE. MARIE CANAL.

The report of the superintendent of the Sault canal for the month of April shows that 107,058 tons of freight were moved through the canal as against 1,078,613 tons last year, a decrease of 971,555 tons. This great decrease in tonnage is of course due to the fact that the actual season of navigation has not yet opened on the lakes. Last year 204,660 net tons of iron ore were moved through the canal during April, whereas not a single ton of ore was moved this year on Lake Superior. The same comparison applies to the grain movement, 909,500 bush. having been shipped in April, 1907, and no grain whatever having passed through the canal during last month. The coal movement during April, 1908, shows a decrease of 588,638 tons when compared to the movement of coal during April of last year, the respective amounts being 14,680 net tons and 603,318 net tons. Following is the detailed report:

STATISTICAL REPORT OF LAKE COMMERCE THROUGH CANALS AT SAULT STE. MARIE, MICHIGAN AND ONTARIO, FOR THE MONTH OF APRIL, 1908.

ARTICLES.		U. S. CANAL	CAN. CANAL	TOTAL.
EAST BOUND.				
Copper	Net tons	1,109	.....	1,109
Grain	Bushels	.....	.....	.....
Building Stone	Net tons	.....	.....	.....
Flour	Barrels	55,500	.....	55,500
Iron Ore	Net tons	.....	.....	.....
Pig Iron	Net tons	.....	.....	.....
Lumber	M. ft. B. M.	.....	.....	.....
Wheat	Bushels	1,606,080	371,400	1,977,480
General Merchandise	Net tons	272	30	302
Passengers	Number	12	2	14
WEST BOUND.				
Coal, hard	Net tons	.....	2,032	2,032
Coal, soft	Net tons	7,974	4,674	12,648
Flour	Barrels	.....	.....	.....
Grain	Bushels	.....	.....	.....
Manufactured Iron	Net tons	3,452	1,772	5,224
Iron Ore	Net tons	.....	.....	.....
Salt	Barrels	8,545	5,700	14,245
General Merchandise	Net tons	8,369	10,403	18,772
Passengers	Number	21	87	108
SUMMARY.				
Freight—				
East Bound	Net tons	55,113	11,172	66,285
West Bound	Net tons	21,077	19,696	40,773
Total Freight	Net tons	76,190	30,868	107,058
Vessel Passages	Number	39	95	134
Registered Tonnage	Net	51,188	85,208	136,396

Canadian canal opened April 21 and U. S. canal opened April 27, 1908.

The Atlantic Works, Inc., of Philadelphia, recently shipped one of their latest improved B-11 bevel band-saw machines to the government for the Brooklyn navy yard.

UNSINKABLE AND UNCAPSIZABLE SHIPS OF THE GOULAEFF FORM AND SYSTEM OF CONSTRUCTION.*

BY GENERAL E. E. GOULAEFF, F. R. S. N. A., MEMBER.

It is only since the terrible loss of H. M. S. Victoria by capsizing—a disaster repeated in several cases during the late Russo-Japanese naval war—that it has at last been recognized that as soon as a ship of the present ordinary form, proportions and system of construction receives a blow either by ram, torpedo, shot or collision, perforating the underwater part of the hull and causing more or less serious injuries, the vessel immediately heels dangerously over and loses her stability. Ever since the loss of the Victoria—that is for more than 10 years—I have thought how to solve this problem in the most practical manner, and it is the results of my work in this direction that I wish to bring before the Institution of Naval Architects, trusting that the discussion, after the reading of this paper, may prove that the adoption of the proposed form and system of construction will give us practically unsinkable and uncapsizable ships, even in the presence of numerous under-water openings.

In the proposed system of construction, comprising, as will be seen from the description, some modification of the form and proportions of vessels, I have en-

*Read at Institution of Naval Architects.

deavored to protect the ship against the torpedo by the internal system of construction of the hull.

I have attained this purpose by making vessels much broader than they have been,

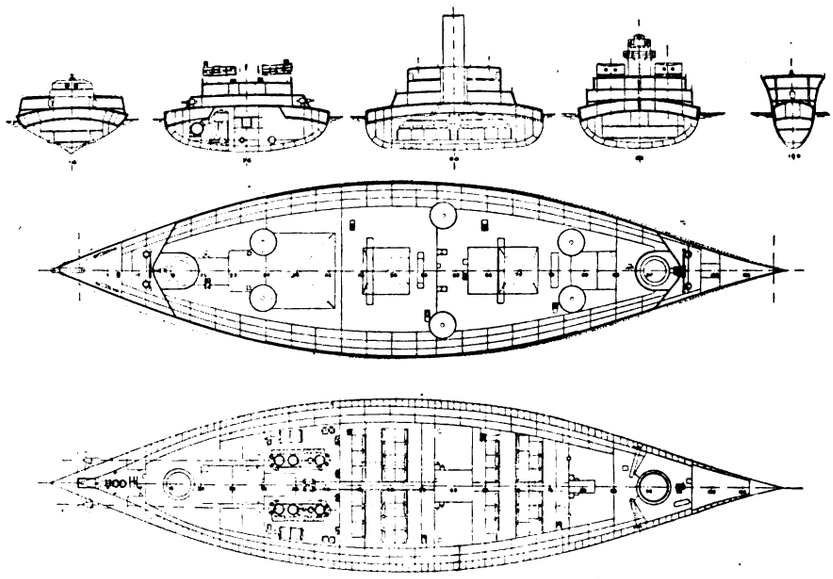

FIG. 1—DETAILS OF THE GOULAEFF VESSEL.

or are at present, leaving their length the same, or making them even somewhat longer. I shall not trouble the institution with a detailed description of this form and system of construction, which provides treble broad longitudinal cellular side corridors, which are rendered possible by the increased breadth of the vessel, and are intended to reduce to a minimum the quantity of water that may enter the ship through injuries or openings made in her under-water skin. Fig. 1 gives a general idea of the transverse sections and plans of hold of a ship of this system of construction. The increase of breadth is made at the expense of the draught of water, so much so that the

$$\frac{B}{D}$$

ratio — amounts to about 4 : 5, instead of 2 to 3, as in vessels of ordinary form and proportions. The displacement is practically the same as that of a ship of ordinary form, with which the comparison is made. In the wide treble side there are safety longitudinal corridors, shown in Fig. 1, surrounding nearly the whole length of the vessel, and I propose to have, as far as practicable, no watertight or other kind of doors, but only the smallest possible permanently-closed boiler manholes, for the purpose of giving access to the cellular compartments from the top. The radius of action of the modern torpedo, inside a vessel, counting from the outer skin inwards, being about 18 ft., I propose to make the width of the cellular side corridors about 18 ft., that is, 6 ft. for each corridor. Thanks to this, all the internal vital parts of the ship, especially those liable to explosion, such as steam boiler, magazines, shot and shell rooms, and torpedo storerooms, etc., are removed from the outer skin for a distance of about 18 ft. inwards on each side towards the center of the vessel, thus very efficiently securing their greater safety from any outside explosion, or any other mode of attack. In larger ships I would suggest having this distance increased to about 20 ft.

When, in 1896-1897, I brought forward my proposal for such ships, I was met by the criticism that the resistance of water to the progress of such broad vessels at any high speed would be altogether too great. But, knowing the results of the late W. Froude's investigations of broad and shallow forms, I felt sure that I was right, at least in this respect.

Fig. 2 shows a curve R R of the resistance, or of effective horsepower at different speeds from 13 to 20 knots, of the Russian ironclad Retvizan, of ordinary form and proportions, compared with a similar curve G G for an ironclad of my own form, and of the same displacement. This diagram, as well as others also described, were based on the results of model experiments which had been made in the St. Petersburg experimental tank. Fig. 2 shows that, whilst the displacement of both vessels is the same (14,265 tons), the indicated horsepower of engines required to drive a ship of the Retvizan shape at a speed of 18 knots amounts to 23,600, whilst the indicated horsepower required to drive a ship of the broader and shallower form, at practically the same speed of 18.42 knots, amounts only to 19,412, and this difference in favor of the broader vessel increases if the speed be further increased.

Other instances were also given comparing the Goulaeff type of vessel with a number of others. M. Goulaeff also claims a better wave formation for vessels of his design.

Ships of my proposed system of construction possess, as compared with ordinary ones, incomparably greater unsinkability and uncapsizability under the effects of torpedoes, shot, rams, and collisions with other ships. The following table will illustrate this point:

TABLE 1.

	Displacement, 17,220 tons.	
	Ironclad of the Goulaeff form and system of construction.	H. I. M. ironclad Emperor Paul I. of ordinary form and system of construction.
Angles of heel under the same conditions of underwater injuries made by torpedoes. Extent of injuries, lengthwise 60 ft.	2° 40′	14°
Angles of heel under the same but still more extensive and severe underwater injuries made by torpedoes. Extent of injuries, lengthwise 170 ft.	6° 50′	30°

From the above table it is evident how much more moderate an angle of heel

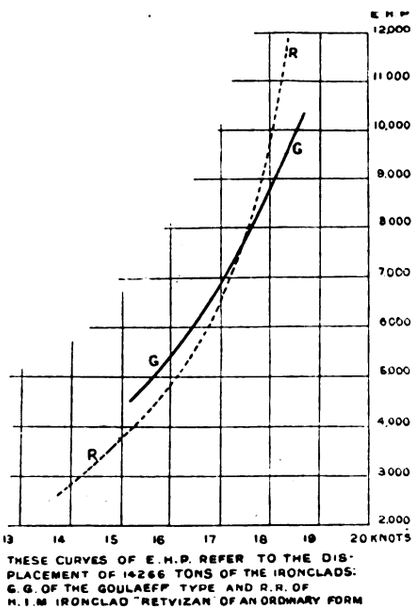

Fig. 2

a ship of my form takes as a result of under-water injuries to the hull, compared with an ordinary ship of the same size, under exactly the same conditions. At the last angle of heel given in the table (30 degrees) of the ironclad of ordinary

form, her side turrets enter the water, and the vessel herself becomes immersed to a draught of 33.25 ft. by the bow and 36.12 ft. by stern, with a still further increase in the quantity of water inside of her, pouring in through the above-water ports and through possible openings made by artillery fire in her sides and spreading along the interior of the 'tween decks, causing her to lose more and more of her stability, until she finally capsizes. Whereas, under the same conditions, as shown in Fig. 3, an ironclad of my form

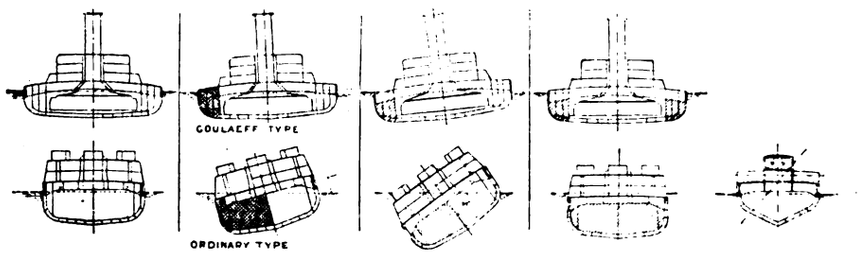

Fig. 3—RELATIVE EFFECTS OF FLOODING

after being struck even by several torpedoes still remains perfectly able to fight her guns or to proceed under her own steam to her destination. The comparative smallness of her angle of heel is shown in Fig. 3, representing the results of extensive calculations of the stability of both vessels, with some compartments (those shaded on the drawing) filled with water, the extent of the underwater injuries sustained being taken lengthwise at 60 ft. and 170 ft., with a radius of destruction of the torpedo 18 ft. inwards. The adoption of this system of construction in mercantile steamers would, therefore, enormously increase their safety in case of collision, and would consequently reduce the rates of insurance required by underwriters. My form and system of construction would not only satisfy this condition, but would greatly reduce the number of cases of ships grounding on shallows or rocks, thus offering additional security for navigation in shallow seas and intricate channels. Increased breadth ensures so much additional internal capacity that great quantities of fuel or other cargo may be stowed on board such ships, as compared with ships of ordinary narrow form, and this favors the adoption of such ships either for distant cruising purposes or for carrying a large cargo in hold, and passengers above in the central upper structure. The safety cellular corridors so effectively isolate all the vital parts and stores of the ship liable to explosion and ignition, such as magazines, torpedo storeroom, etc., from the outer skin of the vessel, that the blowing up of these by detonation from the explosion of an enemy's torpedo or mine outside in the vicinity of these parts is most efficiently prevented.

It has been urged that, owing to the increased breadth of such ships, their stability, measured by the metacentric height, being increased, they should be less steady in a seaway than narrower and less stable ships of the ordinary deep form. Having studied this question in connection with the rolling of ships of my form, I will now submit the following interesting facts and data: Mr. Ivan G. Boobnoff, of the I. R. N., a member of this institution, has described the probable rolling of the vessels of my form in the following words: "These broad ships, possessing as they do a very large coefficient of extinction, will have the transverse rolling more similar to the longitudinal rolling of ordinarily shaped ships, that is, a uniform one, without stoppages, and of the same period as the period of the waves. These ships' own oscillations will be reduced by their great breadth, as well as by other peculiarities of their form, so that the ship will roll uniformly, though rather briskly, but with small amplitudes."

C. Tennyson, M. I. N. A., maintains that "a ship of my form, following in her motion that of the waves, will be always remarkably dry, floating like a duck, whatever may be the condition of the waves about her, and therefore she will never be swamped, as this is prevented by the closing of all her above-water hatches, side lights, ports, and other openings; persons on board of her will feel as though the ship does not roll at all; and the work on board will not be impeded by rolling."

Seeing that ships of the proposed type and of large displacement, such as that of modern battleships and ocean steamers of ordinary form, would certainly be as much and even more than 100 ft. in breadth, objection has been raised as to the difficulty of finding docks wide enough to accommodate such broad ships for the purpose of under-water repair and painting. At first sight this may seem to be a serious disadvantage, but it does not present an insurmountable obstacle, for the necessity for broader docks was keenly felt as long ago as the 70's of the last century, when in the well-known Inflexible Committee's Report it was stated: "We note that the beam of the Inflexible was limited by the consideration of the docks available for her repair, but we doubt if this consideration ought to outweigh the great advantages which a further increase of beam would give to vessels of the Inflexible type. We are the more inclined to doubt it, because at present docks capable of accommodating vessels of any breadth can be constructed of iron rapidly, and at no serious cost in comparison with that of such vessels as the Inflexible." Indeed, floating docks now offer a most ready and suitable way out of this difficulty, and their cost is so moderate that there was lately an offer from a well known ship building firm to our government to build an iron clad of my form, together with a floating dock to accommodate the ship, for exactly the same price as an ironclad of the same size but of ordinary form is being built in a Russian yard.

AROUND THE GREAT LAKES.

The lightship Kewaunee has been placed on her station, South East shoal, Lake Erie.

T. M. Lippert has been appointed agent for the Mutual Transit Co. at Cleveland vice R. S. Hart, resigned.

The new government elevator at Port Colborne, having a capacity of 18,000 bu. of grain, is nearly completed.

The Ship Owners' Association of the Pacific coast have elected the following officers: Capt. W. H. Marston, president; James Tyson, vice president; H. L. Stoddard, secretary-treasurer; Capt. Robert Dollar, Capt. Jacob Jensen, Capt. J. C. Eschen, Capt. W. G. Tibbitts, Charles G. Higgins, Fred Fenwick and Dr. Joseph Oliver, directors.

The Canadian government has given notice that Stag Island shoal light, located on the southern end of Stag Island shoal, St. Clair river, has been carried away by ice. A fixed white lens-lantern light, elevated 4 ft. above the water, will be shown from a wooden float moored at the site of the former light from the opening of navigation until the foundation can be replaced for a more permanent structure.

AMERICAN SHIPPING.

BY WALTER J. BALLARD.

Bulletin 91, of the bureau of the census for the year ending Dec. 31, 1905, includes the statistics of all American vessels or craft of five tons net register or over operated on the inland water and coasts of the United States, Porto Rico, and the Hawaiian islands, or between the ports of these and other countries. All craft are included except those owned by the federal government, those engaged in fishing and stationary wharf boats and house boats used largely for residential purposes.

The statistics cover 37,321 active craft with an aggregate tonnage of 12,893,429 and 1,762 idle craft with 179,326 aggregate gross tonnage. In 1889—17 years before—there were reported 30,485 active craft (tonnage 8,359,135) and 1,490 idle craft (tonnage 233,639). The value of the active craft increased from $200,000,000 in 1889 to over $500,000,000 in 1905. In the same period the gross yearly income increased from about $162,000,000 to $295,000,000, or 82 per cent; the number of employes from about 114,000 to 141,000 or 23.8 per cent; and the wages paid yearly from about $41,000,000 to about $72,000,000 or 72.7 per cent.

By far the largest part of the American shipping, 20,032 vessels with an aggregate tonnage of 4,800,000 tons, operates on the Atlantic coast and Gulf of Mexico. The next greatest number, 9,622 vessels with a tonnage of over 4,400,000, is shown for the Mississippi river and its tributaries. But so many of these vessels reported from the Mississippi river are coal barges and scows, that in spite of the large number and great tonnage the value is only about $23,000,000 and the income only about $17,000,000 The smaller number of vessels on the great lakes, 2,990, represented a value of over $130,000,000 and derived an income of over $65,000,000. Shipping on the Pacific coast showed a great proportionate business and did a business valued at about $49,000,000 in 1906.

The substantial increase in American shipping as a whole is due entirely to the increase in steam vessels and in unrigged craft, as the number of sailing vessels decreased over 10 per cent, while their tonnage increased but 1.7 per cent.

Between 1889 and 1906 the number of steam vessels (owned in the United States) increased from 5,603 to 9,927, or 77.2 per cent; their tonnage, from 1,710,073 to 4,059,521, or 137.4 per cent; and their value from $131,567,427 to $386,772,727, or 194 per cent. This increase, moreover, was general on all waters, except the Mississippi river and its tributaries, where the tonnage actually decreased. The greatest absolute increase, except in gross tonnage, is shown for the steam vessels operating on the Atlantic coast and Gulf of Mexico. In gross tonnage the largest increase—1,319,973 tons—was reported from the great lakes, and resulted from the recent construction of large vessels to carry ore and grain.

With the increased size of vessels has come the more general use of the screw propeller. Introduced into the United States in 1841, the screw propeller in 1906 propelled 80.1 per cent of all vessels and 85.5 per cent of the entire tonnage. Stern wheels were in use on the next largest number of vessels, 70.4 per cent of which were in the Mississippi river district; the side-wheel type still predominates among ferry boats.

FREIGHT MORE THAN DOUBLED.

In 1889 nearly 130,000,000 net tons of freight were carried by American vessels; in 1906 over 265,000,000 tons were so carried, an increase of over 100 per cent. The proportionate increases for freight carried on the Atlantic coast and Gulf of Mexico and on the great lakes were even considerably larger.

On the basis of tonnage moved, coal, 49,000,000 tons, is the most important item of freight in the water commerce of the United States. Next to coal is iron ore—41,000,000 tons in 1906, an increase of 400 per cent since 1889. In the great lakes region large quantities of grain—3,689,329 tons—were transported by water in 1906.

Considerable decreases are shown in the shipments of lumber and ice, due to forest exhaustion near water courses, and the manufacture of artificial ice.

APRIL LAKE LEVELS.

The United States lake survey reports the stages of the great lakes for the month of April, as follows:

Lakes.	Feet above tide-water, New York.
Superior	601.68
Michigan-Huron	580.82
Erie	573.22
Ontario	248.02

Since last month Lake Superior has fallen an inch, Lakes Michigan and Huron have risen 2¾ in., Lake Erie has risen 6¾ in., and Ontario 7½ in.

During the present month Lake Superior should rise 4 in., Michigan, Huron and Erie 3 in., and Ontario 2½ in.

Lake Superior is 8 in. higher than in April, 1892, 2½ in. higher than in 1898; but it is an inch lower than in 1899, 3½ in. lower than last year, 5½ in. lower than in 1906, 7 in. lower than in 1905, and 4 in. lower than the average April stage of the past 10 years.

Lakes Michigan and Huron are 19 in. higher than in April, 1896, 5¾ in. higher than the average April stage of the past 10 years, 1½ in. higher than in 1905, and about the same height as in 1890; but they are 1½ in. lower than last year, 2 in. lower than in 1906, and 29 in. lower than in April, 1886.

Lake Erie shows the highest April stage since 1890, when it was only ¾ of an in. higher. In April, 1887, it was nearly 8 in. higher. It is 6 in. higher than last year and an inch higher than in 1904. The lake is 23½ in. above its stage in April, 1895, and 11½ in. above the average April stage of the past 10 years.

Lake Ontario shows the highest April stage since 1885, when it was 5 in. higher. It is 14 in. higher than last year, a foot higher than in 1904, 23 in. above its average April stage for the past 10 years, and 38 in. higher than in April, 1895.

Lake Ontario will probably go on rising until July, and by that time be 4 in. higher than during April. Excessive rainfall may make this rise 6 in. or a foot. After July it should recede, reaching the April stage in September.

The present high water in Lake Ontario is caused, first, by ice in the St. Lawrence river checking the outflow from the lake; second, excessive precipitation in the Ontario basin; third, the large flow entering by the Niagara river, due to the high stage of Lake Erie; fourth, the closing of one of the outlets of the lake at the Galops rapids, by the Gut dam. If this dam were not in place, Lake Ontario would be 6 in. lower than its present stage.

TROUT PROPELLER WHEELS.

This story illustrates how an order for an article, when well made, becomes a friend and brings in quite a respectable business. About a year ago H. G. Trout, the King Iron Works, 226 Ohio street, Buffalo, N. Y., received an order from an insurance adjuster in New York city for a propeller wheel 11 ft. 6 in. diameter for the steamship Katie. She is a Norwegian fruit steamer. The wheel was shipped and the company heard nothing concerning it until November, when an order was received from Mobile for a propeller wheel for the steamship Fort Morgan with the request that the wheel be similar to the Katie wheel. Last week the company received an order from Mobile for a wheel for the steamer Helen Speaford, to be similar to the Fort Morgan wheel. The company also received an order from the owners of the Fort Morgan for a duplicate wheel, to be used in the steamship Fort Gaines. A further order was received for a 10-ft. 6-in. wheel for the steamship Bodo, all traceable to the original Katie order.

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DRIVING AT A FOREIGN TRUST.

Undaunted by the tie vote of the house committee on post office and post roads, by which the ocean mail bill failed of a favorable report to the house of representatives, the friends of ocean mail legislation have succeeded in inserting the Gallinger ocean mail bill as an amendment in the senate to the regular post office appropriation bill, and in this way the ocean mail measure will come up in the house before this session has ended.

The support for the ocean mail bill in the senate is very strong. After a full debate the Gallinger bill, on March 20 last, was passed by the senate without a division, all of the Republican and many Democratic senators favoring it. Senator Simmons of North Carolina, who spoke earnestly for the bill, after his amendment had been adopted limiting the expenditure to the estimated revenue from the foreign mail service, declared that if a roll call had been three-fourths of the Democrats would have gone on record in the affirmative. The business interests of the South Atlantic and Gulf cities earnestly desire legislation which will give the south direct communication of its own with South America — something which foreign ship owners do not and will not provide.

All the rules of senate procedure have been complied with. On the day after the adverse vote of the house committee, Senator Gallinger introduced the ocean mail bill in the senate as an amendment to the postoffice appropriation bill and had it referred to the committee on commerce. This committee promptly ordered a favorable report, which was presented by Senator Gallinger and referred to the postoffice committee. In form this amendment makes an appropriation for carrying into force a bill already passed by the senate. It is, therefore, not subject to a point of order as new legislation, and it will not be subject to a point of order in the house of representatives.

This session of congress has been singularly fruitless thus far in legislation designed to build up trade and industry. Never, probably, in 50 years has a session of congress done so little to advance the prosperity of the United States. This ocean mail bill, next after the proposed currency legislation, is the one measure of value to the business interests of the country, and shrewd politics as well as sound statesmanship should influence the house leaders to work with all their might for its enactment.

The ocean mail bill will give the country a naval reserve. It will extend our export commerce and stimulate our ship building. But it will do more than that; it will strike a finishing blow at a particularly arrogant and oppressive monopoly. As President Roosevelt has said: "It is not a good thing that American merchants and manufacturers should have to send their goods and letters to South America via Europe if they wish security and dispatch." Everything that can be said against domestic trusts applies and more to the insolent and greedy European ship "combine" that dominates the direct carrying trade from our ports to Brazil and Argentina. This trust provides good ships and favorable rates for the manufacturers and merchants of Europe. But it provides inferior ships and exacts unjust rates in the export rade of our manufacturers, merchants and farmers to South America.

These are all facts of record. American ministers, consuls, travelers and merchants in South America have testified again and again that this European ship trust, absolutely foreign in control and ownership, is the one great obstacle to a profitable trade between the United States and the chief Latin-American republics. Since 1893, when this "combine" broke down an unsubsidized American mail line, it has been in complete control of the carrying trade from New York to South America. A year or two ago the Brazilian government, in despair at the exactions of the trust, started a steamship line of its own, but its ships are few and slow and the trust has virtually ignored its competition.

Only a few weeks ago, at a meeting in London, the British and German ship owners, composing the trust, ordered an advance in freight rates on all American goods shipped from our ports to Brazil. This increase has gone into effect. It amounts in some cases to 50 per cent above the former figures, and it falls especially on western provisions and other agricultural products for which there is so much natural demand in Brazilian markets.

It is almost incredible that these European trust magnates should have increased their freight rates in sheer defiance of American interests at a time when an ocean mail bill, that would break up their monopoly, was pending in the American congress. But these foreign magnates were assured by their agents in New York and Washington that the ocean mail bill, though favored by the president, Secretary Taft and Secretary Root, would probably fail because of western opposition in the house of representa-

tives. In other words, this foreign trust depends upon the representatives of the very men whom it is fleecing to prevent any effective interference with its grasping and extortionate monopoly.

When Mr. Murdock of Kansas, Mr. Stafford of Wisconsin, and Mr. Haggott of Colorado voted against the national administration and against this ocean mail bill last month in the house post office committee, they were inadvertently sustaining this most impudent of all trusts, and baffling the efforts of President Roosevelt to destroy it. We have no doubt that if these three gentlemen had known all the facts in the case they would have stood by the national administration and the majority of their Republican colleagues.

Now the issue is to be put up to them a second time. It is to be put up to the house of representatives. This ocean mail bill is no subsidy in the ordinary sense of the word; it is legitimate pay for actual services rendered. But it carries the power to destroy this European ship monopoly in the only practicable way—for the Interstate Commerce Commission has recently decided that such foreign ship combinations cannot be reached by American law. They can be reached, however, by the vigorous competition of regular American steamship lines, owned in this country, run in American interests and dependent for their success on increasing the export trade of American manufacturers, farmers and merchants.

The issue, as it will be presented in the house, is really the American manufacturer, farmer and merchant and the national administration against a European steamship trust, a greedy, insolent, intolerable, alien monopoly. The debate should be aggressively pushed along this line. And if any western representative, when the issue is made clear, refuses to stand by the president and to sustain the administration against the European trust, he will have a very hard time in justifying himself to his constituents.

The ore dock of the Northwestern road at Ashland, which is being rebuilt, will not be completed until about June 15.

LAKE SITUATION.

At a general meeting of vessel owners held at the Colonial hotel in Cleveland on Wednesday it was decided not to open navigation in the bulk freight trade until June 1. As a matter of fact there will be very little sense in opening it at that time if conditions do not materially improve. H. S. Wilkinson, of Syracuse, presided as chairman of the meeting. While his fleet has grown to be one of the leading fleets on the lakes, it was the first time that many of the vessel owners had the pleasure of meeting him.

Inquiries among the furnace interests do not reveal any disposition to purchase ore and the statistics published elsewhere in this paper show that Lake Erie stock piles are ample. Furnace piles are doubtless likewise. Ore on dock May 1 of the present year was 5,480,300 tons, as against 1,976,988 tons for May 1, last year, an increase of 3,503,212 tons. This is the largest amount of ore that Lake Erie docks have ever held on May 1, though over 4,000,000 tons remained on dock in May, 1904. The significant thing, however, is that orders for ore are not forthcoming and that any attempt to force the lake trade at the present time would result in complete demoralization of rates. No one wants the present rate disturbed as it has obtained for the past three years and has lent great stability to the trade. Contract coal cargoes that had to be delivered as soon as the weather opened have all been attended to and the spurt in the grain trade is over. There is therefore for the time being nothing for the boats to do.

G. A. Tomlinson, of Duluth; John Craig, of Toledo; Capt. James Corrigan, Capt. John Mitchell and Capt. Charles L. Hutchinson, of Cleveland, were appointed a committee to investigate all freight contracts and to urge owners to keep their boats in port until business demanded the putting of them into commission.

Meanwhile vessels are fitting out and engineers are gradually going to their ships, but the activity hitherto manifested at every port on the lakes at this time of the year is to be observed nowhere.

The declaration of the open shop on the part of the Lake Carriers' Association has not met with any opposition except in detached and minor instances. John Connelly, business agent of the Firemen's Union at South Chicago, has been arrested for assaulting a non-union oiler on the steamer George W. Perkins. The Lake Carriers' Association have demanded his expulsion from the union and will take charge of the case against him.

M. A. Hanna & Co., operating the Pennsylvania docks at Ashtabula, have notified the men that they do not expect to operate the Kings, Fast Hoist or Portables at that port this season. The object in making the announcement thus early is to permit the men to seek employment elsewhere. Reports of expected trouble on many of the docks are unfounded. There can be no trouble, the situation being altogether too weak.

PIG IRON SITUATION.

Favorable effects are being noted from the last New York meeting of pig iron and ore interests. Lowering of quotations by companies which had been asking the highest prices followed the removal of obligations to maintain prices, and there is now a general feeling that bottom prices have been reached. This feeling is strengthened by the firm attitude of ore interests in declining to recede from their position or make any concessions to buyers. There is more life in the pig iron market than for many weeks, leading southern interests holding at $12, Birmingham, for No. 2, and refusing large tonnages offered at $11.50, Birmingham.

General sellers of billets show no disposition to follow the example of the Buffalo company which cut the price $3 a ton, and increased firmness is being shown on crude steel and finished material. A number of large contracts for structural material have been placed the past week, in Chicago, New York, Duluth and Albany.

Two sections of the proposed new channel through Middle Neebish and Hay lake in St. Marys river will be readvertised and new bids solicited. Bids for the four sections into which the improvements are divided were opened in April but the figures on sections 3 and 4 are deemed too high and Col. C. McD. Townsend, government engineer, will invite new tenders. Charles Simono, of Two Rivers, Wis., was given the first section at $81,951, and the Great Lakes Dredge & Dock Co., of Chicago, the second section at $587,600.

The Great Lakes Dredge & Dock Co. were the lowest bidders for dredging the Calumet river from 123d street to the forks near the mouth of Calumet lake. Their bid was 22.9 cents per cu. yd. and the total sum involved is about $108,000.

Our Pilot Rules Deficient

The pilot rules governing the navigation of vessels on the great lakes, are, in many respects, shamefully deficient. The law is both defective and incomplete. The rules are inadequate to their purpose and do not cover ordinary conditions and circumstances, to say nothing of others; they lack clearness of expression which render them confusing and perplexing. Many of the rules are insufficiently specific; they are easily misinterpreted, and consequently misapplied. It is this incompleteness that afford them more than one meaning, and give them the flexibility of the willow twig, to be bent, turned and twisted at will. These may seem strong statements and unwarrantable, but they are, nevertheless, the verdicts of 75 per cent of lake masters.

What is badly needed are simple rules, clearly defined and complete in their purpose; rules with one meaning and this meaning to be explicit.

The government pilot rules, in addition to covering the rules of navigation, should be a veritable text book on the subject treated, so that the beginner and licensed man alike may have the opportunity of thoroughly understanding them. It should not only contain all this information thoroughly, but it should clearly explain the principles underlying the work. The rule makers have always seemed to take it for granted that the underlying principles are understood or should be understood by the user, and that a clear explanation is unnecessary. This is very wrong, indeed. As it now is, the men must pick up this information as best they can. It may seem a broad statement to make, but it is none the less true, that half the licensed men do not really know the meaning of the command of "Starboard," and they invariably say "Starboard wheel" for "Starboard helm." Is it any wonder then that the average lawyer can muddle a man all up when he gets him on the witness stand? With the present rules the licensed man could make the lawyer squirm were he to exchange places with him.

THE PRESENT LAW.

"Rule I. In all weathers every steam vessel under way in taking any course authorized or required by these rules shall indicate that course by the following *signals* on her whistle, to be accompanied, whenever required, by corresponding alteration of her helm; and every steam vessel receiving a signal from another shall promptly respond with the same signal or sound the danger signal as provided in Rule II."

In all weathers every steam vessel under way in taking any course authorized or required by these rules shall indicate that course by the following signals on her whistle, to be accompanied, whenever required, by corresponding alteration of her helm.

The portion in italics of Rule I is ambiguous in sense. It is confusing and it has so been proven, for the writer has only to refer to the first part of Supervising Inspector Westcott's talk on the subject before the Pittsburg S. S. Co.'s masters last winter, wherein he cites a case exemplifying it. The writer could furnish any number of similar illustrations if necessary. Now, what makes this portion of the rule confusing?

For the answer read the rule omitting the words "authorized or required by these rules;" that is, "In all weathers every steam vessel under way in taking any course shall indicate that course by the following signals on her whistle." This, in a measure, explains why this portion of the rule is misconstrued. Now, don't come back with the argument that if the words "authorized or required by these rules," were inserted that there would be no occasion for such misunderstanding, and that the rule means just what it says. This may all be very true but the mere fact that the rule is *not* understood by many of those for whom it is intended, should in itself, be sufficient evidence to condemn it, and to supply another that could be thoroughly understood.

It must be further borne in mind that these rules are for the use of every class of licensed men, and that this classification includes all the varied types, some with little education and perception, others with a limited amount, and so on up In other words, these rules are not studied, learned and digested by these men with the same degree of thought and reasoning that the admiralty lawyer could give them; and it is not intended that they should. There are laws in the Pilot Rules that an admiralty lawyer could not define, to say nothing of their execution; yet the officer of the deck must apply them in practice and if he is not equal to the task runs the risk of losing his license for incompetency.

"*One blast* means, 'I am directing my course to starboard,' except when two steamers are approaching each other at right angles or obliquely, other than when one steamer is overtaking another, one short blast signifies intention of steamer which is to starboard of the other to hold her course."

To untangle the foregoing, which is a part of Rule I of the present law, would require the services of a Philadelphia lawyer. Now, why couldn't they have made it read thus, for this is what it really means: "In the following three situations, *one blast* (given or answered) means, 'I am directing my course to starboard;' that is, (1) where two steamers are meeting 'head and head' or nearly so; (2) where the overtaking steamer desires to pass the steamer being overtaken; (3) where two steamers are approaching each other at right angles or obliquely, so as to involve risk of collision, the steamer to port directs her course to starboard." The blowing of one blast by the steamer that is to starboard in this case indicates that she will hold her course and speed, having the right of way, and that the steamer to port of her must direct her course to starboard, in other words, she must do the maneuvering. The steamer that is to starboard of the other must be first to give the signal of one blast and the steamer that is to port must answer immediately with the same signal or the danger signal as provided by Rule II.

"*Two blasts* means, 'I am directing my course to port,' except that when two steamers are approaching each other at right angles or obliquely, other than when one steamer is overtaking another, two short blasts signify desire of or assent to steamer which is to port of the other to cross the bow of the steamer to starboard."

The foregoing is the last part of Rule I. It is even more ambiguous than the rule for "one blast;" in fact, it is absurd, for witness: "* * * two short blasts signify desire of or assent to steamer which is to port of the other to cross the bow of steamer *to starboard;*" should read, "* * * * to cross the bow of (*the*) steamer (*that is*) to starboard." If the steamer that is to starboard of the other assents to the other in crossing her bow, the steamer to port holds her course and speed, and the steamer to starboard must direct her course to port

in order to go astern of the other. The steamer to port of the other must be first in blowing the two blasts, and the other, if such action is agreeable to her, answers with two blasts and immediately starboards her helm or directs her course to starboard if necessary. If the steamer that is to starboard, which has the right of way, because of her position with respect to the other, does not assent to giving up her right of way to the steamer that is to port of her, she immediately signifies her unwillingness by blowing the danger signal as provided in Rule II.

As it should be:

In all weathers every steam vessel, which, according to these rules, is required to keep out of the way of another steam vessel, shall be governed by the following prescribed helm signals, indicated by whistle: *One (short) blast,* either answered or given, to mean, "I am directing my course to starboard;" *two (short) blasts,* either answered or given, to mean, "I am directing my course to port."

One blast—means to port the helm (same as directing course to starboard); two blasts—means to starboard the helm (same as directing course to port).

The command of "Starboard" is a contraction of "Starboard your helm;" that is, directing your course to port.

The command of "port" is a contraction of "Port your helm;" that is, directing your course to starboard.

WHERE BOTH STEAMERS USE THE HELM.

Steamers in meeting "head and head" or nearly so, each must give way to the other; i. e., both shall port or both shall starboard their helms to pass in safety.

WHERE ONE STEAMER ONLY USES THE HELM.

When two steamers are approaching each other at right angles or obliquely, one of the vessels has the right of way over the other and holds her course and speed regardless of the helm signal given and answered. The steamer that is to starboard of the other has the right of way and shall be first in sounding the signal of one blast of her whistle to the steamer that is to give way to her by porting her helm, and directing her course to starboard or otherwise keep clear.

An Overtaking Vessel Passing an Overtaking Vessel.—The vessel being overtaken (the one ahead) has the right of way, and where there is ample room, as on the open lake, holds her course and speed regardless of the helm signal she answered. In narrow channels the vessel being overtaken has the right of way, but her course must be governed according to the direction of the channel being navigated, and her speed according to the other vessel's speed—so as to eliminate the effects of suction and dragging.

ANSWERING HELM SIGNALS.

Every steam vessel receiving a signal from another shall promptly respond with the same signal or sound the danger signal as provided in Rule II.

HELM OR COURSE SIGNALS.

One short blast of the whistle given by the steamer that is to starboard of the other signifies that she will hold her course and speed—since she has the right of way; and that the steamer to port of her must answer with one blast and direct her course so that she will pass astern of the other. One short blast of the whistle, answered or given, by the steamer which is to port of the other signifies, "I am directing my course to starboard," and will pass astern of the steamer which is to starboard.

One short blast given or answered by two steamers meeting "head and head," or nearly so, signifies her intention of each to port their helms and to pass to the right or starboard side, same as "directing my course to starboard."

One short blast given by an overtaking vessel signifies desire of the overtaking vessel (the one astern) to pass the steamer ahead to the right or starboard-hand side by porting her helm—same as "directing my course to starboard."

Two short blasts of the whistle signifies desire of or assent to steamer which is to port of the other to cross the bow of the steamer that is to starboard, by directing her course to port—starboard helm.

Two short blasts of the whistle given by the steamer which is to port of the other, asks permission of the steamer that is to starboard, and which has the right of way, of crossing her bow; that is, by directing her course to port—starboard helm. If the steamer to starboard agrees to this she answers with two short blasts, and gives up her right of way, and she must, if necessary, starboard her helm to go astern of the other, which holds her course and speed. If the steamer to starboard will not assent to giving up her right of way to the other, and she is not obliged to, she must sound the danger signal as provided in Rule II.

Two short blasts of the whistle given and answered by two steamers meeting "head and head" or nearly so, signifies the intention of each to starboard their helms and to pass to the left or port-hand side—same as "directing my course to port."

Two short blasts given by an overtaking vessel signifies desire of the overtaking vessel to pass the steamer ahead to the left or port-hand side by starboarding her helm—same as "directing my course to port."

QUESTIONS FOR WHEELSMEN AND WATCHMEN.

478. Convert to the decimal of an hour, 2h. 30m. 45s.

479. A boat steams 10¾ miles an hour, how far does she run in 18m. 30s?

480. A vessel steams 1.5 miles in 8¼ minutes, how fast is she running per hour and how long does it take her to make a mile?

481. A vessel makes 8 miles an hour, how long does it take her to make a mile?

482. It is 133¼ miles from Long Pt. to Southeast Shoal lightship, how long should it take a boat making 10½ miles an hour to cover this distance?

483. If you were steering SW ⅝ W by compass and were told to starboard a half, what course would you then steer by compass?

484. What is the true course and distance from Ashtabula to Southeast Shoal lightship?

485. If it took your boat 8.5 hours to cover this distance, how fast is she going per hour?

486. If you had been steering NE and were told to port two points, on which point of the compass would you steady her?

487. If you were steering NNE, what point of the compass would show two points abaft the port beam?

488. If the sun's bearing at rising at any certain place was E by N, what would its bearing be at setting?

ANSWERS TO QUESTIONS FOR WHEELSMEN AND WATCHMEN.

466. 6 days 35 minutes.
467. 2 hours 38 minutes 3 seconds.
468. 10 yds. 1 ft. 1 in.
469. 16 hours.
470. 4 hrs. 48 mins.
471. 5/36.
472. 16 hrs.
473. 5/24.
474. 16 hrs. 16 mins. 15 sec.
475. 16 days 5 hrs. 4 mins. 8 sec.
476. 5.51 degrees.
477. 0.63 of an hour.

GLADIATOR-ST. PAUL COLLISION.

The circumstances attending the collision of the cruiser Gladiator and the American liner St. Paul are thus related in the *Engineer*, of London:

"On Saturday afternoon last, as his majesty's second-class cruiser Gladiator was on a voyage from Portland to Portsmouth, she was run into by the American liner St. Paul just west of Yarmouth in the Isle of Wight. She was so badly damaged that she listed heavily, and on reaching to within a few hundred yards of the shore of the island, whither she drifted by the action of wind and tide, she took ground, heeled over on her beam ends, where she now lies in the position and condition indicated by the two accompanying engravings, which have been reproduced from photographs taken by Stephen Cribb, of Southsea. Unfortunately, in spite of the lowering of boats from the St. Paul, and of the gallant efforts of a company of soldiers and numbers of coast guards, boat men, and others on shore, there was a serious loss of life.

"It is no part of our purpose to attempt to fix the responsibility for the accident upon anyone, and we shall merely put on record the facts of the case as we know them. The Gladiator left Portland at 10:30 A. M. on the Saturday for Spithead, where she was due to arrive about 4 P. M. Hurst Castle was passed at 2:23 P. M., and at this time it was snowing very hard. There were squalls, and sometimes it was very thick. At 2:28 the liner St. Paul was observed by Captain Lumsden, of the Gladiator, to be half a point off the port bow, and at a distance estimated at about half a mile. The ordinary rule, when two vessels meet one another, is that they should pass port side to port side. If this rule has to be departed from, owing to exceptional circumstances, such as might be met with in a narrow and difficult channel, two blasts on the siren are given by one vessel, and if heard answered by the other. There appears to be conflicting evidence as to whether this was done in the present instance, so we make no comment whatever on the matter, as without doubt the collision will form the subject of an inquiry and a court martial. All that we are in a position to state is that two blasts were reported as being given by the St. Paul, and accordingly the helm of the Gladiator was put over 30 degrees to starboard, that is, nearly hard-a-starboard. This, of course, would have the effect of sending her to port, this being done with the intention of passing to the starboard of the St. Paul. A collision, however, became inevitable, and when the vessels were some 50 yards apart the Gladiator's helm was put hard-a-port. At the moment of the impact orders were given to stop the engines and to go full speed astern. The Gladiator's speed before the collision is given as being 9 knots through the water, and she had a 2½-knot flood tide under her.

"According to the evidence given by Captain F. Passow, of the St. Paul, at the inquest held over the bodies of some of those who lost their lives, the liner was outward bound for New York, and had gone full speed nearly to Yarmouth, and then had her speed reduced to half in accordance with Trinity House regulations. Passing Yarmouth her speed is estimated by those on board as being slightly under 10 knots. The Gladiator was, apparently, not observed till she was from a quarter to half a mile away. The St. Paul's engines were stopped entirely, so that it might be observed what the vessel ahead was. The helm was then put hard-a-port and the starboard engine full speed astern. The effect of this was to put the head of the vessel to starboard. It was then noticed that the cruiser was closing in as if on the starboard helm, and accordingly the port engine was put full speed astern. Unfortunately this did not have the effect of preventing a collision, and the Gladiator was struck on the starboard side, nearly amidships, just abaft the sixty-seventh frame and fore of the after stokehold. When the collision took place the St. Paul stopped both her engines and then went slow ahead so as to keep in the gap she had made and to hold up the stricken vessel. When, however, asked to do so by the captain of the Gladiator, the captain of the St. Paul backed away at full speed. The St. Paul, according to the evidence, was on a mid-channel course.

"After the vessels had parted the cruiser began to list very heavily, and was carried, as above stated, by wind and a strong tide towards the shore of the island. She took the ground near Black Rock buoy, about 400 yds. from the shore. Almost immediately she turned completely on her starboard side, the stern being almost dead on shore. The St. Paul stood by and lowered boats. She herself was considerably damaged, and was taken back to Southampton, being unable to continue her voyage.

"The Gladiator belongs to the Arrogant class of second-class cruisers. She had a length of 320 ft., a beam of 57½ ft., and a maximum draught of 24 ft., while her displacement was 5,750 tons. She was built at Portsmouth, being laid down in January, 1896, and launched in December of that year. She was engined by Maudslays, and had a designed speed of 19 knots, which she could maintain. She was but lightly armored. Her full complement was 480 men, though at the time of the collision she had 262 on her books, and was actually carrying rather less than that number.

"The St. Paul was a twin-screw vessel, built by Cramp & Sons, of Philadelphia, in 1895, and belonging to the American line, being sister vessel to the St. Louis. She is 535 ft. 6 in. long, has a 63-ft. beam, and a depth of 26.8 ft. Her registered tonnage is 11,629. Her engines, which are quadruple-expansion, are capable of indicating 20,000 H. P. and of giving her a speed of 21½ knots."

AROUND THE GREAT LAKES.

President Wm. Livingstone, of the Lake Carriers' Association, is in Washington attending the conference called at the White House by President Roosevelt to conserve the natural resources of the country.

The D. & C. line has placed the steamer State of New York on the new Bay City division of its service. The steamer leaves Detroit on Wednesdays and Fridays and Bay City on Sundays and Thursdays.

The steamer John Stanton of the Hutchinson fleet with 10,000 tons of coal aboard grounded while entering Portage river, knocking a hole in her side and filling her forward compartment with water. It will be necessary to lighter the steamer and make temporary repairs before she can be released. She lies in such a position as to block navigation through the lower entry.

The Great Lakes Dredge & Dock Co. were the lowest bidders on the contract for building the new government dock at the turning basin in the Chicago river near Ashland avenue. The new dock will be 480 ft. long.

The steamer James H. Hoyt, which left Buffalo bound for Cleveland without cargo, went ashore at Battery Point, near Dunkirk. She was released by the tugs Mason and Cascade of the Great Lakes Towing Co.'s fleet.

Two hundred freight handlers on the Canadian Pacific railway docks at Owen Sound went on strike this week because their wages were cut from 15 to 13 cents an hour.

ATLANTIC COAST GOSSIP

ATLANTIC COAST GOSSIP.

Office of the MARINE REVIEW,
Room 1005, No. 90 West St.,
New York City.

The Cunard Line steamer Mauretania, which was held up by fog at the bar for the larger part of the day, docked at New York on Saturday morning. During the voyage she lost a blade of the outboard port propeller.

At the annual meeting of the New York & Baltimore Transportation Co., held at Baltimore last week, the interests represented by John Monks, Jr., of New York, formally took control. It is said that Mr. Monks intends to develop it as a freight line, with headquarters at Baltimore. The newly-elected officers of the company are: John Monks, Jr., president, and Bertram R. Roome, of New York, secretary and treasurer. The directors include Messrs. Monks and Roome, Alton S. Miller, of Baltimore; Richard A. Monks, of New York, and John Cadwalader, Jr., of Philadelphia.

The new steamship Oklahoma was cleared at the Philadelphia custom house last week for Dublin and Belfast, with 2,400,000 gallons of refined petroleum in bulk. She is commanded by Capt. Gunther, formerly of the steamship Larimer, and was built for the J. M. Guffy Petroleum Co., by the New York Ship Building Co.

The steamship Washtenaw, which stranded on Friday night on the New Jersey coast, was floated Monday and towed to Stapleton, S. I., by the wrecking tug Rescue. The Washtenaw hailed from Sabine Pass for New York with a cargo of Texas oil in bulk, 100,000 gallons of which had to be lightered before the vessel could be floated. It is believed that she sustained little damage. The accident was due to a dense fog.

The senate on Monday passed without amendment the house bill to authorize additional aids to navigation in the lighthouse establishment. The bill provides that every lighthouse keeper and assistant shall receive either one ration a day or commutation for it at the rate of 30 cents per day, and also includes many appropriations for addition to the service, such as tenders, buoys, lights, etc.

Capt. Eastaway, of the Allan Line steamship Siberian, reported on arrival at Philadelphia, passing several large icebergs on the voyage.

Diamond Shoal lightship, No. 72, from the outer Diamond shoals, Cape Hatteras, has arrived at New York to be overhauled and prepared for service on her station.

The new steamship George W. Fenwick, which left Newport News on Feb. 18, in command of Capt. Lord, has arrived at San Francisco. She is intended for the general coasting trade.

Twenty-three stowaways were found on the Cunard liner Mauretania on her last voyage to New York. All but seven were found before the arrival of the vessel at Queenstown, where they were landed. The remainder were transferred at New York to the Campania, which sailed shortly after the Mauretania arrived, their stay in the land being necessarily short.

The old sloop-of-war St. Mary's, which for the last 23 years has been used as a schoolship at New York, is to be handed back to the government with a view to selling her. The St. Mary's was built at the Washington navy yard in 1843 as a third-class sloop-of-war, and was equipped with 20 guns. During the Civil war she was attached to the Pacific fleet and did not take part in any of the engagements of the war.

The old Staten Island ferryboat Southfield has been placed out of commission in New York harbor and will be used as an adjunct to the tuberculosis ward of Bellevue hospital.

The new steamship Ancona of the Italian Steam Navigation Co., from Philadelphia via New New York for Italy, arrived at Naples with 2,500 emigrants after a run of 11 days 8 hours.

The White Star line announces its intention of starting a Canadian service in the spring of 1909. The steamers placed in this service will be the Albany and Alberta — renamed the Laurentic and Megantic—and the Dominion liners Canada and Dominion.

Capt. T. H. Peterson, of the Sandy Hook life-saving crew, has resigned to take charge of the revenue launch Guide. Capt. Peterson headed the crew that went 70 miles down the Jersey coast to rescue the passengers of the wrecked steamer Cherokee, and also took off the people aboard the steamship Drumelzier when she went ashore off Fire Island.

The pilots of the Delaware river and bay have decided to take five apprentices to learn the business. Three of these will be selected from Pennsylvania, and two from Delaware.

The ship building and construction plant of S. & J. Russell, Newtown Creek, Long Island City, was completely destroyed by fire on Monday night. The loss is roughly estimated at $30,000. The plant is known as the Long Island Machine & Marine Construction Co., and was engaged in the construction of tugs, small craft, docks and engines.

It is expected that a direct line of steamers will be established between Philadelphia, New Orleans and Galveston, by the Southern Pacific Steamship Co., in the near future, the offices to be located in Philadelphia. It is intended that only freight will be carried for the present, but, if business justifies the experiment, a direct passenger service will be put in force.

The United States Steamship Co., owner of the steamship United States, has brought suit in the United States district court of New York against the steamship Monterey, to recover $50,000 damages for a collision which happened between the vessels on April 16. The papers allege that the collision and damage were not due to any fault or neglect on the part of the navigators of the United States, but that the officers of the Monterey were wholly responsible. The United States is of Scandinavian ownership.

Owing to increased trade with America compelling greater dock facilities, the Mersey dock board has approved plans for extension to cost $16,000,000. The increased extensions are partly due to the fact that the White Star Line contemplates building two vessels of about 900 ft. in length.

The Danger Signal

The rules should specify more clearly the various definitions of the danger signal. These are many and in the judgment of licensed men much too numerous; too much is required of this signal. It may mean to check down and stop; it may mean to back; it may mean to stay astern; it may mean to repeat your signal; it may mean that you are in danger, or I am in danger; it may mean look out; it may mean you are notified to blow for sides. It may also be used as a signal of attention, and what not?

It is the consensus of opinion that the "check" signal and "come-ahead-strong" signal on the big whistle should be legalized. If they were it would materially assist in simplifying some of the things now required of the danger signal. The objection to these signals by the rule makers is that you have no right to tell another how to handle his boat. This is a mistake. If these signals were used in conjunction with the danger signal they would answer the purpose admirably. For example: Supposing the case of a steamer bound up the river, she is close to the bank and close to the bottom in a dangerous part of the river. A boat is coming down under full speed, and the conditions are such that the upbound steamer deems it dangerous to pass, why should it be unlawful for him to blow a check whistle to the pilot of the other boat? He could blow a danger signal and then the check whistle. The other fellow would know at once just what was required of him, whereas he might not if simply the danger signal were given. The rule makers claim that the danger signal is sufficient. No master is going to blow check whistles at another simply to notify him that he does not know how to handle his boat. There are other cases where these signals are absolutely necessary.

Another case: Supposing a steamer is steering and handling badly in the river, which is often the case; a danger signal followed by a check whistle notifies the approaching vessel what is required of her. It often happens that wreckers working in the river, want a passing boat checked down. According to the law they must blow a danger signal. The approaching vessel, especially in the night time, does not know whether she is to check down or to stay back, since the danger signal can mean either. Other cases, such as a balking steering gear, rounding-to to go to anchor or to a coal dock.

At the Lime Kiln crossing, and similar places, the check whistle blown between passing steamers is necessary to safety. The law governing the blowing and answering of these signals should not be made so strong that one pilot could compel another to check down, simply because the law said so. If the pilot receiving the signal does not deem it necessary to check or that it would be dangerous for him to check, he need not be obliged to. Even such a provision would seem unnecessary, for no sane man is going to abuse such a privilege.

The same thing is true with the come-ahead strong whistle. There are times when such a signal is necessary, such as the vessel being overtaken, to have the other hurry up and get by.

The rule makers object to the hurry up or four blast whistle because it is liable to conflict with the danger signal. This could be easily remedied by blowing the hurry-up signal in the same manner as in striking time on a ship's bell, that is, two sharp blasts in quick succession, with a little longer interval, and then two more blasts in quick succession. This signal could be preceded by the danger signal.

Rule III refers to Rule II; in fact, they are a part of each other. Rule III forbids the use of cross signals, and yet Rule III might be interpreted that it is permissible under certain conditions, but then we know that it is not permissible because the rule makers have warned us not to use it under any circumstances.

Rule XI and the Sixth Situation should be omitted from the rules. They are not only confusing but superfluous as well. The objection to the rule is that it is liable to be confused with the Fifth Situation, and that some might get the impression that under certain conditions that the vessel that is to port of the other has the right of way, and that it would be difficult to determine when such was the case. The argument used is that if there is no risk of collision the respective vessels will be so far from each other as to hardly require the blowing and answering of passing signals; but, if any ways close the right of way belongs to the steamer that is to starboard of the other, and in maintaining her rights would complicate matters for the vessel that is to port.

The pilot rules forbid the use of cross signals, yet they are used every day in practice, and under conditions that avert instead of causing trouble. To illustrate: Two steamers are meeting each other in the river, one bound down and the other bound up. The one bound down blows one blast and the one coming up mistakes it for two blasts and answers with two blasts. If there is plenty of room and it is immaterial to the steamer bound down which side she takes, as is often the case, she does not blow an alarm signal, or repeat her signal. She simply answers with two blasts and lets it go at that. This is not in agreement with Rule II, yet it seems to be the best way out of it.

It oftentimes occurs that the steamer bound up river will be first in signaling for side to the steamer bound down. The steamer bound down does not want that side, and by virtue of her having the right of way, need not accept it. What does she do? She simply sounds the danger signal and then blows for the side she elects to take, and the up-bound steamer answers her signal. This is not in agreement with Rule II, yet it is the best and safest way out of it.

In crowded navigation, if it were not for cross signaling, there would be more collisions than now; and yet the law says never to blow a cross signal.

It should be stated specifically in the rules that the steamer having the right of way, should always be first in blowing the signal of her intention, and the other should wait a reasonable length of time for such signal; provided, however, that if in the judgment of the pilot who is waiting for such signal, deems it time for such signal to be sounded, either in case of negligence or otherwise, it should be his duty to sound the danger signal as a notification to the other to make his intention known immediately.

The danger signal, or Rule III, should be modified so as to include the following conditions: Any steamer having the right of way and receiving a signal from another that would take from her this right of way, should be privileged in blowing the signal for her side immediately after sounding the danger signal. The other should answer the signal imme-

dately; but, if for any reason she cannot, then she is to observe the provisions of Rule II.

A pilot on receiving a cross signal from another through a misunderstanding, or otherwise, should be privileged in answering it without recourse to the danger signal. This privilege need not be a compulsion, but a right.

If, for any cause whatever a vessel, which, under ordinary conditions, is to keep out of the way of another, is prevented from so doing, should have the right to signal her intention immediately after blowing the danger signal; and none of the above conditions should be considered cross signals, as the present law considers them.

STEERING AND SAILING RULES.
SAILING VESSELS.

A vessel which is running free should keep out of the way of a vessel which is closehauled, should be made to read: A vessel which is running free shall keep out of the way of a vessel which is under way with the wind forward of abeam.

Closehauled means as close to the wind as a vessel will sail and keep her sails full. Some vessels can sail closer than others. Some vessels lie as close as four points from the wind, while others lie 5 and 6 points. The rules give it as anything inside of 8 points, for in a fog the signal to be given by a vessel on the starboard tack, with the wind forward of abeam, is one blast of the fog horn.

The use of the word closehauled in one part of the rule makes it conflicting with the other part of the rule that says "with the wind forward of abeam." This would make the law uniform.

Some signal by whistle ought to be provided for boats rounding to in the rivers, such as at Smith's coal dock and at Sandwich. Three long blasts would be the proper signal. Also for boats landing at a dock along the river. The passenger boats that stop at the docks along the foot of St. Clair river in the night time simply blow one blast of the whistle to notify the dock man of their approach. Another boat proceeding down the river takes it for a passing signal and shifts her helm. This is a serious proposition and many the master that has been up against it. Three long blasts would also be the proper signal in this case.

ORE ON DOCK MAY 1.

Statistics gathered from the various dock managers at Lake Erie ports show that the amount of ore on Lake Erie docks May 1 of the present year was 5,480,300 gross tons, as against 1,976,988 tons in 1907, an increase of 3,503,312 tons.

The total rail shipments from Lake Erie ports to furnaces during the winter season (Dec. 1 to May 1) aggregated 1,905,428 tons, viz.:

On dock Lake Erie ports, Dec. 1, 1907.7,385,728
On dock May 1, 1908.....5,480,300

By rail to furnaces, winter of 1907-8.1,905,428

Adding these winter shipments to 29,787,018 tons, the amount shipped to furnaces during the navigation season of 1907 gives 31,692,446 tons as the entire consumption of ore from Lake Erie ports during the year ended May 1, 1908, as against 30,099,769 tons for the year ended May 1, 1907, as against 28,984,358 tons for the year ended May 1, 1906, as against 20,057,070 for the year ended May 1, 1905, as against 18,739,995 tons for the year ended May 1, 1904; 21,905,251 tons for the year ended May 1, 1903; 17,216,065 tons for the year ended May 1, 1902; 14,465,260 tons for the year ended May 1, 1901; 15,882,881 tons for the year ended May 1, 1900; 12,122,982 tons for the year ended May 1, 1899; and 10,209,488 tons for the year ended May 1, 1898. The following table gives the amount of ore on dock at the opening and closing of navigation for 10 years past:

IRON ORE ON LAKE ERIE DOCKS—GROSS TONS.

	Opening of Navigation			Close of Navigation.		
Ports.	May 1, 1908.	May 1, 1907.	May 1, 1906.	Dec. 1, 1907.	Dec. 1, 1906.	Dec. 1, 1905.
Toledo	217,788	147,397	52,550	518,645	281,000	368,024
Sandusky	42,256	5,439	29,320	44,545	17,467	52,977
Huron	392,731	98,106	80,738	415,730	245,499	208,023
Lorain	327,052	176,300	140,452	366,271	336,321	271,695
Cleveland	1,029,198	447,573	350,382	1,281,335	1,224,606	1,330,619
Fairport	225,328	154,246	266,162	523,981	590,783	759,961
Ashtabula	1,799,454	568,485	462,564	2,056,820	1,631,312	1,589,951
Conneaut	462,392	139,853	148,528	1,090,774	1,057,424	976,976
Erie	595,660	189,276	169,483	652,219	552,631	564,961
Buffalo	388,441	50,313	90,906	435,406	315,412	315,780
Total	5,480,300	1,976,988	1,791,090	7,385,728	6,252,455	6,438,967

TRUSCOTT BOATS.

Grasping the opportunity for advantageous display of its products on the Great White Way of New York City, the Truscott Boat Manufacturing Co. of St. Joseph, Mich., recently opened new, palatial show rooms at 1675 Broadway, where a complete line of Truscott boats and engines are now on exhibition.

Charles A. Saunders, president of the New England Boat and Engine Builders' Association, is in charge of the new branch and is enthusiastically dispensing his genial and courteous attention to his many new and old acquaintances in that field. Mr. Saunders is a well-known figure in the boat and engine trade of the east, and his connection with the Truscott company in New York elicits the best wishes of his many friends and acquaintances.

OBITUARY.

Capt. Alex Clark died at Buffalo recently. His last command was the steamer Robert Mills. Since his retirement from active sailing he had been engaged in the ship chandlery business.

Capt. Charles B. Huse died at his home at St. Clair, Mich., last week. In the early days when vessels were towed through the Detroit river he was a very active tug man. He later sailed the passenger steamer Riverside. His last steamer was the Dean Richmond. He was born in Cleveland in 1842 but made his home in Michigan since 1860.

Capt. Eber Ward, one of the most widely known vessel agents, died at Detroit recently at the advanced age of 84 years. Capt. Ward began steamboating in 1843 as clerk on the steamer Huron. Four years later he purchased the Huron and shortly thereafter built the Franklin Moore. He was a member of a family which for many years dominated the commerce of the lakes. It was his boast that he established the first line of steamers to ply between Detroit and Lake Superior. In this line were the steamer Keweenaw Craig, Fremont, Coburn and St. Paul. Appropriate resolutions concerning his life work were adopted by the vesselmen of Detroit.

The Cassier Magazine Co. announces the removal of its New York offices from No. 3 West Twenty-ninth street to No. 12 West Thirty-first street, to which latter address all communications should hereafter be sent. The new home of *Cassier's Magazine* is in the office building just erected on the site of the former house of the American Society of Mechanical Engineers, a location especially convenient of access from the new railroad terminals and easily reached by the various systems of local transport from all parts of the city.

The Robert Dollar Co., announce their removal to their new office in the Marine building, San Francisco.

APPOINTMENTS OF MASTERS AND ENGINEERS

AMERICAN TRANSIT CO., CLEVELAND, O.

		CAPTAIN.	ENGINEER.
Str.	John Dunn, Jr.	J. H. Driscoll	William Beckbissinger

W. H. BECKER, CLEVELAND, O.

Str.	Francis Widlar	Henry Hinslea	George Allen
"	B. F. Jones	C. M. Ennes	John Quinn
"	James Laughlin	T. G. Simmons	William Millington
"	W. G. Pollock	Clarke Byers	Edw. Reilley
"	E. N. Ohl	F. B. Chilson	Jas. O'Connors
"	Alexis W. Thompson	George A. Symes	W. H. Ballard
"	John A. Donaldson	Thomas Beggs	—— Krueger
"	Francis L. Robbins	A. J. Greenley	Chas. Church

M. A. BRADLEY, CLEVELAND, O.

Str.	M. A. Bradley	Matthew Mulholland	C. Castle
"	George Stone	Paul Howell	Jack Dalton
"	Gladstone	Paul V. Howell	——
Bge.	Maurice B. Groven	Charles Anderson	

CANADIAN PACIFIC RAILWAY DETROIT RIVER FERRY SERVICE, WINDSOR, ONT.

C. F.	Michigan	C. H. Jenking	F. Merrill
C. F.	Ontario	James Carney	Alex McDonald

COWLE TRANSIT CO., CLEVELAND, O.

Str.	John B. Cowle	——	Charles Coushane

CROSBY TRANSP. CO., GRAND HAVEN, MICH.

Str.	Nyack	S. A. Lamoreaux	Karl Hallberg
"	Conestoga	W. A. McCowan	B. H. Hopkins
"	Pere Marquette 5	Charles Moody	Charles Grubben

R. J. DUNHAM, CHICAGO, ILL.

Str.	City of London	Arnold Green	Ernst Narjal
"	Black Rock	John F. Hanson	Frank Reilly

HANEY & MILLER, TORONTO, ONT., CAN.

Str.	Juno	Charles McDermand	Thomas King
Sch.	Sligo	Daniel McVicker	
"	Recruit	Joseph Hough	
"	P. B. Locke	Barney McIntyre	

WILLIAM LIVINGSTONE, MGR., DETROIT, MICH.

Str.	William Livingstone	William Morehead	Richard Sutliff

HENRY MCMORRAN, PORT HURON, MICH.

Str.	Gogebic	A. C. Neal	George Merrill
"	Britannic	E. H. Davis	Frank Cadotte
"	Linden	William J. Cowles	——
"	Pawnee	James Cassin	Edward Wehner

MARINE NAVIGATION CO., MICHIGAN CITY, IND.

Str.	Francis Hinton	Odin Larson	John H. Dutz

J. C. MILLER, MARINE CITY, MICH.

Str.	Rand	J. C. Miller	Alonzo Smith

JOHN MITCHELL, CLEVELAND, O.

Str.	Hugh Kennedy	Charles B. Galton	William J. Fritz
"	Joe S. Morrow	William Ferguson	Peter Lavelley
"	Loftus Cuddy	Harvey A. Stewart	John D. Riley
"	Joseph Sellwood	Richardson C. Jackson	Charles J. Love
"	Pendennis White	Fred Fertaw	Frank B. Parker
"	Stephen M. Clement	H. H. Townsend	William F. Sauber
"	Moses Taylor	Fred Galton	Frank J. Hiller
"	Frank H. Goodyear	F. R. Hemenger	Irvan A. Francombe
"	James Gayley	Millard M. Stewart	John Maedel
"	William H. Gratwick	John D. Baird	William Zuehlke
"	Walter Scranton	R. Z. Utley	Henry Graves
"	John J. Albright	Joseph W. Autterson	Otto Gey
"	William E. Reis	William J. Tomlin	Louis C. Minnie
"	E. A. S. Clarke	James B. Lowe	John Wellhousen
"	M. A. Hanna	Richard C. O'Connor	John Ward
"	Hendrick S. Holden	G. E. Anderson	John Scott
"	Lagonda	Ed Johnson	William L. Leng
"	John J. McWilliams	Martin Walle	John Gibson
"	Major	Walter Rouvel	John Hughes
"	Robert L. Fryer	George J. Bennett	Albert Jacobi

MONTREAL & CORNWALL NAVIGATION CO., LTD., CORNWALL, ONT.

Str.	Filgate	Peter Haim	Narcisse Marchand
"	Emerald	Joseph Lefevre	Edmond Chertier

PITTSBURGH STEAMSHIP CO., CLEVELAND, O.

Str.	George F. Baker	George A. Bell	E. S. Stoddard
"	Sir Henry Bessemer	William S. Hoag	A. G. Haig
"	Clarence A. Black	Andrew Hansen	Richard Mastin
"	Briton	George Holdridge	J. R. McRae
"	R. W. E. Bunsen	John T. Gemmell	Frank Mansfield
"	Cambria	F. W. Light	L. O. Willix
"	Thomas F. Cole	J. W. Morgan	H. T. McLeod
"	J. B. Colgate	John McGarry	Joseph Hasler
"	Coralia	M. H. Campau	M. B. Sturtevant
"	William E. Corey	F. A. Bailey	M. N. Toner

BURIAL AT SEA.

Representative Lovering has introduced in the house of representatives a bill providing for the safe transportation to the port of destination of bodies of persons dying at sea. It is the practice of steamship companies to immediately bury at sea persons that die in transit. Those who have witnessed such burials with the informal simple ceremony, a plain box weighted and permitted to slide from a plank into the sea after a few words have been spoken, have doubtless been impressed by the apparent indifference to the feeling of parents or relatives who may either be aboard or waiting at the port of destination. The bill is a very sweeping one and reads as follows:

"Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That all steamships and vessels sailing to or from any port of the United States shall be provided with the necessary means and appliances sufficient for the transportation to the port of destination of the bodies of all persons dying upon the voyage. And it shall be the duty of owners, commanders, or officers sailing such steamships or vessels to transport to the port of destination the bodies of all persons dying upon the voyage unless the person dying shall otherwise request, or unless the death shall have been caused by a malignant contagious disease.

"Section 2. That it shall be the duty of the secretary of the treasury to provide such regulations as shall be necessary to enforce the observance of this act, and the collector of the port shall refuse to grant clearance papers to any steamship or vessel that shall not be equipped as provided for by section 1 of this act, or that shall infringe any of the regulations provided by the secretary of the treasury in pursuance thereof.

"Section 3. That any owner or agent of any steamship or vessel who shall neglect or refuse to comply with the provisions of this act shall be punished by a fine not exceeding $5,000."

FIRST STEAMER SINCE 1891.

The following report from J. Perry Worden, counsellor at Bristol, is quite interesting as showing how slim the direct shipping trade between the United States and that port is. An American steamer recently touched at that port, the first since 1891. Counsellor Worden says:

"The first American steamer scheduled for Bristol since 1891 sailed from

		CAPTAIN.	ENGINEER.
Str.	Cornell	W. H. Kilby	T. E. Bouchard
"	Corona	George W. McCallum	Wm. Densmore
"	Corsica	W. E. Stover	William Hasler
"	Henry Cort	J. A. Ferguson	L. H. Smith
"	Crescent City	Frank Rice	C. L. Birtrand
"	James B. Eads	Arthur Montague	R. W. Hunter
"	William Edenborn	Charles Gegenheimer	S. H. Hunter
"	Isaac L. Ellwood	C. H. Cummings	Levi Walder
"	Empire City	James Burr	F. A. Spencer
"	John Ericsson	John R. Noble	J. J. Parr
"	Sir William Fairbairn	C. J. Grant	Thomas Treleaven
"	H. C. Frick	Neil Campbell	S. W. Armstrong
"	Robert Fulton	C. G. Ennis	George Arnold
"	E. H. Gary	Richard Jollie	John Dupont
"	German	J. C. Bell	L. L. Hineline
"	J. W. Gates	James A. Walsh	James Inman
"	W. H. Gilbert	A. W. Burrows	W. G. Tilton
"	Griffin	W. F. Hormig	Henry F. Schroeder
"	Harvard	A. R. Robinson	J. H. Riggin
"	J. J. Hill	A. J. Talbot	H. E. Schmidt
"	Douglas Houghton	John F. Parke	Alex McKenzie
"	Joliet	W. J. Story	Gus Johnson
"	La Salle	W. E. Warner	Alfred Holland
"	Linn	George H. Banker	Herman Dupont
"	Thomas Lynch	E. M. Smith	A. L. Eggert
"	Alex McDougall	John Nahrstedt	H. E. McIntosh
"	Malietoa	R. F. Humble	J. B. McDermid
"	Manola	S. E. Meeker	James Dungan
"	Maricopa	C. A. Weitzman	J. H. McGlenn
"	Marina	A. E. Bartel	H. W. Firby
"	Mariposa	C. D. Secord	Duncar McVicar
"	Mariska	A. R. Thompson	A. D. Birdsall
"	Maritana	W. P. McElroy	John F. Walsh
"	Maruba	C. S. Boyce	Bernard Cassady
"	Masaba	E. L. Sawyer	Harry Edmondson
"	Mataafa	H. J. Regan	S. D. Graham
"	Samuel Mather	George D. Burt	Frank Limpert
"	Matoa	Thomas Wilson	E. R. Leedham
"	Maunaloa	J. LaFramboise	Frank Schwartz
"	J. P. Morgan	A. P. Chambers	Duncan Fraser
"	S. F. B. Morse	E. O. Whitney	C. A. Fletcher
"	Simon J. Murphy	George H. Bowen	Henry Annett
"	J. B. Neilson	T. J. Cullen	William Bourlier
"	W. P. Palmer	Dan McGillivray	———
"	G. W. Perkins	W. H. Moody	F. A. Smith
"	Henry Phipps	W. B. MacGregor	E. H. Learned
"	Gen. O. M. Poe	W. C. Iler	Fred Warning
"	Princeton	John Burns	Andrew Jackson
"	Queen City	A. C. Smith	William A. Marshall
"	Norman B. Ream	A. C. Chapman	F. L. Smith
"	Rensselaer	S. C. Allen	Neil McNeil
"	Frank Rockefeller	A. G. McLeod	J. M. Conroy
"	H. H. Rogers	James Leisk	E. W. Fox
"	Roman	George Randolph	William Dornbrook
"	Saxon	George W. Ames	A. P. Williams
"	Howard L. Shaw	H. Culp	E. J. Rae
"	Sir William Siemens	M. K. Chamberlain	M. F. Sweeney
"	George Stephenson	H. G. Harbottle	J. W. McEachren
"	Superior City	F. J. Crowley	William P. Diamond
"	Superior	A. H. Kent J. Hursley	George W. Ingham
"	J. B. Trevor	H. Walper	H. M. Lubahn
"	Van Hise	F. C. Watson	John Skelly
"	James Watt	W. J. Hunt	A. J. Armson
"	Wawatam	H. T. Kelley	W. D. Killett
"	P. A. B. Widener	Fred Hoffman	A. W. Armson
"	A. B. Wolvin	George O. Reece	———
"	Zenith City	H. Gegoux	George H. Barth
		L. C. SMITH TRANSIT CO., CLEVELAND, O.	
Str.	Harry Coulby	Alex Forbes	John Davidson
"	Lyman C. Smith	W. D. Ames	William Roach
"	Charles Hubbard	C. Z. Montague	Ed Reading
"	Smith Thompson	George W. Pierce	William Davidson
		STAR-COLE LINE STEAMERS, DETROIT, MICH.	
Str.	Arundell	———	James Potter
"	Huron	———	John Clark
		L. S. SULLIVAN, TOLEDO, O.	
Str.	Eugene Zimmerman	F. B. Cody	James D. Stewart
"	Portage	Thomas Bennett	D. Conway
"	David W. Rust	J. E. Jacobsen	D. McNivon
Sch.	C. C. Barnes	G. E. Nelson	
"	John Schuette	John O. Johnson	

Philadelphia recently with a cargo of oil, and the incident, otherwise unimportant, has aroused no little interest in this old port, which once maintained a brisk shipping trade with the United States. Not less than 50 American vessels discharged here in 1875, but soon thereafter American ships began to disappear from southwest England, and the last American ship in Bristol was a three-masted schooner from Maine, which dropped anchor here in August, 1901. Since then the American flag has never floated from a vessel in Bristol waters.

"A coincidence with the sailing of the American steamship mentioned seemed to be the re-establishment of a special line of English freight steamers between Philadelphia and Bristol. One of them has made the first trip of any steamer from Philadelphia to Bristol in the last six or eight years. The owners of the line, however, who acted on the urgent advice of one of the leading shipping firms here, have been compelled to draw off a vessel, reducing the number to two, owing to the small amount of cargo ready to be sent from Philadelphia to Bristol.

"All Bristol now concentrates its attention and hope on the gigantic enterprise of the docks at Avonmouth, which have already cost the city $12,137,747, and there is little doubt that the reason why American shipping with Bristol is so unimportant is not due, or at least will not long remain due, to any fault of the merchants of Bristol. The docks, said to be among the finest in the world, and capable of accommodating any ship, are here, facilities for local and inland transportation are excellent, and the merchants are most favorably disposed toward American trade. Scarcely a day passes that, in conversation with shopkeepers or proprietors of large stores, I do not come upon some article of American manufacture brought here via London, Liverpool, or Southampton.

"Bristol and vicinity furnish little return cargo for the United States, and the fact that Bristol ship owners have to scour the coasts for something to send back—sending at present considerable clay from Fowey—speaks favorably for their enterprise and desire to meet American shippers more than half way. Without wishing to overstate the prospects, it does seem that with a little effort American shipping with Bristol could be greatly increased, and it is to be hoped that such an increase will occur in the near future."

BOSTON MARINE NOTES.

Boston, May 13.—Orders have been received at the Boston navy yard from the navy department at Washington to push work on the cruiser Yankee, which is at the present time at the navy yard undergoing repairs. When the Yankee has been completed she will do duty on the Atlantic coast as parent ship for the torpedo boat service.

The Lansford, one of the new ocean-going barges for the Lehigh Coal & Navigation Co., arrived at this port last week. The Lansford is of the latest type of coal carrying barges. She is a two-masted schooner-rigged vessel, 180 ft. overall, 173 ft. on the keel, 35 ft. beam, 14½ ft. hold, 830 gross tonnage, 732 net, and will carry 1,200 tons.

Capt. F. Stanhope Hill, secretary of the Massachusetts Nautical Training School, will retire May 15, after 14 years of service.

Foreign commerce at the port of Boston for the week ending May 4 does not compare favorably with a year ago, showing a decided falling off in value, as has been the case nearly every week since the first of the new year. Imports totaled only $1,519,819, as against $2,747,217 for the same time a year ago; while exports amounted to $1,905,106, compared with $2,262,016 the corresponding week of 1907.

Lieut. Y. Kamimura, of the Imperial Japanese navy, who for the past 18 months has been stationed at the works of the Fore River Ship Building Co., sailed on the Saxonia for Liverpool last week. Lieut. Kamimura has for the past year and a half been watching the building of four turbine engines which the Fore River Ship Building Co. is building for the Imperial Japanese navy. The officer was one of the youngest naval officers at the engagement of Yalu river, in the Chinese-Japanese war. He is a graduate of the naval university at Tokio, about 35 years old and speaks the English tongue well. He will cross the continent on the Siberian railway, and will visit the battlefields of the Japanese-Russian war.

In consequence of the continued dullness in ocean freight, inward and outward, the Leyland line has cut down its Boston sailings. After the sailing of the Bohemian, which left for Liverpool Wednesday, there will not be another Leyland liner until May 18, when the Winifredian will sail for Liverpool. The Devonian will lay up at Liverpool indefinitely. The Canadian is also at the English port, where she will be out of commission for two months. The Cestrian was withdrawn some months ago. It is rumored that the Cunard line intends to place the freighter Sylvania out of commission temporarily.

Assistant Engineer Glen S. Burrell, for the past 14 months stationed at the Boston navy yard, has been ordered to Honolulu for duty by the navy department.

Thirteen Spaniards and two other foreigners were brought to Boston from West Virginia by United States inspectors, and were deported on the Saxonia when she sailed May 4, it being charged they came to this country as contract laborers. A strong fight to keep the men in the country was made by influential parties. The decision was against the men and they were deported, the Cunard line paying the passage home.

What is believed to be some of the wreckage of the steamer Bortland, which foundered Nov. 27, 1898, was brought to the surface by the crew of the fishing schooner Teresa and Alice in their trawls while fishing off Highland light recently. The junk consisted of a line of copper wire connected with a switch, an anchor and considerable wreckage. The sailors say that they were on the site of the sunken steamer.

An order has been issued by the navy department to Commander John L. Gow to continue duty at the works of the Fore River Ship Building Co. at Quincy.

The schooner Hawaii which was launched April 4, near Honolulu, Hawaii Islands, was designed in Boston, by B. B. Crowninshield. The Hawaii, which is 50 ft. on the water line, was built for the trans-Pacific race from San Francisco to Honolulu. All her equipment was made in Boston. The Hawaii has been scheduled to leave Honolulu May 1 for San Francisco and it is expected that a month will be consumed in the voyage.

Senator Lodge, of Massachusetts, was one of the 23 senators who voted for the amendment to the naval appropriation bill urged by the president for four battleships instead of two. Senator Crane voted against it.

Through the efforts of the Master Mariner's Association of Gloucester and untiring labors of Congressman Gardner, the lighthouse board has voted to establish a gas buoy on Ten Pound Island ledge, and the order of the department will be immediately carried out by the inspectors of the second lighthouse district. Commander C. J. Boush gives notice that on or about May 11 a red gas buoy, to be known as Ten Pound Island Ledge Gas Buoy No. A6, showing a fixed red light during periods of five seconds, separated by eclipses of five seconds duration, will be established to mark Ten Pound Island Ledge, Gloucester Harbor, on the following approximate bearings (magnetic): Ten Pound Island lighthouse, N. E. 7-8 E.: Eastern Point lighthouse, S. 9-16 E.: Gloucester Harbor life saving station, W. by S., and Rock Buoy No 6A, a spar now marking the ledge, will be discontinued.

On or about May 11, 1908, Great Round Shoal Southeast Gas Buoy No. 6, at the easterly entrance to Nantucket Sound, Massachusetts, will be moved and permanently established at a point about 5/16 of a mile S E., ½ E. from its present station.

Notice is given by Commander C. J. Boush, inspector of this lighthouse district, that on or about May 22, a gas buoy, painted red, numbered 2 and showing a fixed white light during periods of five seconds duration, will be established in 20 ft. of water in Quick's Hole Passage, from Vineyard Sound into Buzzard's bay, in the position now occupied by Quick's Hole Ledge Buoy 2, a second class nun, which will be then discontinued. The bearings will be: Pasque Island, right tangent southeast by east ¼ east; Nashawena Island, left tangent south southwest ¼ west; Lone Rock Buoy north 15-10 west.

For the information of mariners, Commander Boush has issued notice that Spiers Stand south end buoy No. 2, a third-class can, located in Hingham bay, has been moved to clear the shoal which extended in a southerly direction and permanently established on the following approximate bearings: Pig rocks beacon, north northeast 11-16 east; tower of Strawberry hill east 15/16 north; Sunken Ledge beacon north by west 3/16 W

Lieut.-Commander Charles P. Plunkett, who has been on duty at the Boston navy yard since last December, has received orders from the navy de-

partment detaching him from duty at the navy yards and ordering him to the works of the Fore River Ship Building Co.

The steam otter-trawler Spray caught and brought to Boston last week the first sturgeon to be captured on the fishing grounds of Georges Bank. While the Spray was fishing on the southerly end of Georges, one of the nets required the combined strength of the crew. When brought to the surface it was found to contain among other fish a giant sturgeon. A fierce struggle took place, and not until heavy iron bars were brought down with great force upon its hard skull was it finally rendered helpless. It weighed 282 pounds and measured 9 ft. overall. It was purchased by A. F. Rich & Co., and disposed of to the trade for 30 cents per pound, bringing about $60.

The April export figures for the port of Boston show the enormous decrease of 1,006,945 bushels of grain sent to Europe from Boston last month, compared with April of 1907. During April this year the total grain shipments aggregated 621,605 bushels. Last year the figures were 1,628,550. The first four months of this year show exports of 3,540,621 bushels compared with 5,759,521 for the same period a year ago. This is a loss of 2,218,900 bushels.

The steamer Admiral Dewey has been in drydock at East Boston, where she received two new propellers, besides being scraped and painted.

On the arrival of the four-masted coal schooner Mary Krum last week, Peter Santos, a member of the crew, who had been in irons for 10 days, was arrested by United States Deputy Marshal James Ruhl. He was charged with assaulting and wounding the master of the schooner, Capt. Krum, while on the high seas.

Lightship 92, which will be a relief vessel on the Pacific coast, was launched April 30, from the yards of the Fore River Ship Building Co. The vessel will go to San Francisco under its own power.

The old schooner Ernestine, formerly the brig of that name, has been sold at U. S. marshal sale to satisfy claims against her for repairs and other expenses. She was purchased by R. T. Green Co., for $460.

THE LOOKOUT.

The navy department has announced that the examination for assistant paymasters in the navy, originally set for June 6, has been postponed to June 29. This was done in order to give an opportunity to graduates of colleges and universities to take the examinations. They will be held in Washington. At the present time there are seven vacancies in the corps of assistant paymasters.

Daniel R. Hanna, of Cleveland, has purchased the schooner Ingomar, built by the Herreshoffs in 1903 for Morton F. Plant.

Vice President Fairbanks has announced the appointment of Senators Gallinger, of New Hampshire, and Smith, of Maryland, as members of the board of visitors to the naval academy at Annapolis, Md., for the present year.

Niles-Bement Pond Co., and the Pratt & Whitney Co., announce a quarterly, 1½ per cent dividend, preferred, payable May 15.

The battleship New Hampshire will go to Portsmouth, N. H., during the month of July to receive her $6,000 silver service, the gift of the state, and a stand of colors to be presented by the New Hampshire Daughters of the American Revolution.

The new British turbine cruiser Indomitable has beaten all warship speed records, making 28 knots on the measured mile on the Clyde, and keeping up 26¼ knots under continuous steaming.

The question has often been asked whether or not a part owner in a boat, vessel or ship can sell his own particular part without the consent of the other part owner or owners. Part owners are not partners, but are tenants in common of the vessel. Each has a distinct and separate interest, and may sell his interest without the consent of the other part owners. They are not partners without an express contract to that effect. The mere fact of part ownership does not raise a presumption of partnership.

Guy Murchie, friend of the president, has qualified and is now United States marshal for the Boston district. Mr. Murchie succeeds Col. Charles K. Darling, who resigned to fill the position of clerk of the United States court of appeals.

The American line has subscribed $2,500 to the relief fund for the families of the men of the cruiser Gladiator who lost their lives in the collision with the steamer St. Paul, recently.

Senator Stephen B. Elkins has purchased the big steamer Marietta from the executors of the estate of Robert N. Carson, of Philadelphia. It is said that the vessel is intended as a wedding gift for his daughter Katherine when she marries the Duke of the Abruzzi. It is a well known fact that the duke is an expert sailor, being the sailor duke of the royal blood in Italy, and a ranking officer in the Italian navy and an Arctic explorer of note.

The state department has decided that it will not be feasible to negotiate a treaty this season for the consideration by The Hague tribunal of the Newfoundland fisheries dispute. The case has yet to be made up and the lawyers have not yet been put to work on it. The treaty has to be carefully drawn as the issue of the arbitration agreed upon at London months ago may depend largely upon the wording of the treaty and the definition of what is to be submitted to arbitration. As there is not sufficient time in which to place a treaty before the senate at this session, Secretary Root will ask that the present modus vivendi affecting fishing in Newfoundland waters be continued another season.

Two seamen of the German battleship Elsass were killed and six others were wounded at Kiel, Germany, April 29, as the result of the premature explosion of a mine.

The senate committee on commerce has adopted the report of its subcommittee on the Newlands waterways bill. This report fixes the appropriation at $10,000,000 and authorizes the issuance of bonds when the "Waterways fund" falls below $5 000,000, in order to keep the fund up to that amount. The full committee hoped to report the measure as early as possible.

The German navy league annual report shows the membership increased from 906,705 members to 1,018,590 members. It is carrying on a campaign of eduaction by giving stereoptican views and lectures in German villages.

The Ecuadorian cruiser Cotapaxi arrived at Guayaquil, Ecuador, with the crew of the steamer Cacique, which was totally destroyed by fire off Santa Elena point. The fire originated through an explosion of naphtha and all efforts to save the vessel proved unavailing. No lives were lost.

That steamer Deike Rickmer, towed into Halifax, N. S., by steamer St. Bride, broke her propeller by coming in contact with sunken wreckage, was made known when a port warden survey was held on her. Along the port side could be seen marks where the

wreckage scraped and where it was thrown up when the propeller struck it. Three blades were snapped off.

The fishing season of 1908 for St. Pierre, Mich., has opened disastrously for the French fishing fleet, and although the operations began only recently, nine vessels have been sunk. So far as known no lives have been lost this spring. Last season 10 vessels foundered, 251 men lost.

A total of approximately 42,500 miles will have been covered by the Atlantic battlship fleet when it arrives at Hampton roads on Feb. 22 next, according to estimates made by the naval officials. The longest lap of this distance is that from Honolulu to Auckland, 3,850 miles.

While exploring the Monterosa glacier on the afternoon of April 30, a party of guides discovered in an ice crevasse a body, which they cut out of the ice and brought to Berne. Later the body was identified as a guide named Naghi, who fell into a crevasse in the summer of 1887 while conducting a party over the glacier. The body was well preserved.

The death of Imperial Prince Kittumaro Yamachima was announced at Tokio, May 3. His highness, who was 35 years of age, was a captain in the navy.

The prisoners at the Portsmouth, N. H., navy yard who were assigned to tear out some bulkheads and remove old machinery from the Topeka were relieved from that duty because it was found that they were not adapted for the work.

The secretary of the treasury may issue a register or enrolment for any foreign vessel which shall have been wrecked on the coast of the United States, and shall be purchased and repaired by a citizen thereof, on satisfactory proof that the repairs are equal to three-fourths of the cost of the vessel when repaired.

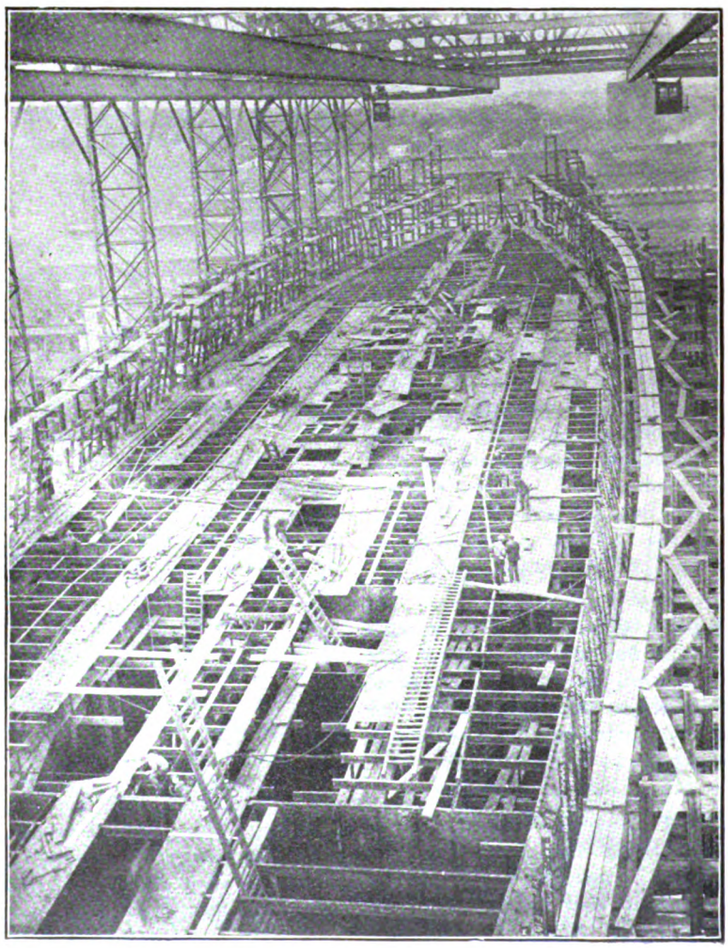
BATTLESHIP NORTH DAKOTA.

The accompanying photograph shows the battleship North Dakota as she appeared on May 1 at the yard of the Fore River Ship Building Co., at Quincy, Mass. She was at that time 31.6 per cent complete, an increase during the month of April of 5.9 per cent.

LIGHTSHIP NO. 92.

The Fore River Ship Building Co., Quincy, Mass., launched lightship No. 92 from its yard on April 30, the sponsor being Miss Ethel Randell. The lightship will be stationed on the Pacific coast as a relief ship. Lightship No. 90 underwent her trial May 7 successfully. Lightship No. 93 was launched on Thursday of this week.

LAUNCHING LIGHTSHIP NO. 92.



BATTLESHIP NORTH DAKOTA ON MAY 1.

MILWAUKEE - WESTERN FUEL CO.'S NEW BOOK.

The Milwaukee-Western Fuel Co., Milwaukee, Wis., have just put out a book on Milwaukee as a coal distributing port. The purpose of the book is to acquaint coal dealers and consumers with Milwaukee's important position in the distribution of the enormous tonnage of anthracite and bituminous coal from that city. Coal shipments on the great lakes during 1907 amounted to 20,000,000 tons, of which amount 4,108,919 tons were shipped to Milwaukee, representing a value of about $16,000,000. Of this amount about 60 per cent is consumed locally and the balance reshipped to west and northwest territory. This coal trade is steadily growing and Milwaukee's is increasing in proportion. Up to 1907 Milwaukee enjoyed the distinction of being the leading coal receiving port on the lakes. Superior, however, has now surpassed it as that port supplies all of the railways leading into the northwest with fuel. The receipts of coal at the principal ports on Lake Michigan and Lake Superior during 1907 were as follows:

	Tons.
Superior	5,102,757
Milwaukee	4,108,919
Duluth	1,921,927
Chicago	1,454,268
Ashland	560,646
Sheboygan	546,694
Escanaba	530,987
Manitowoc	522,000
Green Bay	471,927

Milwaukee's coal receipts show an increase since 1870 as follows:

	Tons.
1870	122,865
1880	368,568
1890	903,659
1900	1,631,008
1907	4,108,919

The largest cargo of coal delivered at Milwaukee in 1907 was 11,348 tons, carried by the steamer Charles A. Weston.

The rapid multiplication of 10,000-ton steamers on the lakes is very well exemplified by the fact that only one steamer of 10,000 tons unloaded at Milwaukee in 1904 whereas 74 such steamers unloaded during 1907. The storage capacity of Milwaukee docks for bituminous and anthracite coal is 2,500,000 tons. It has been the aim of the Milwaukee-Western Fuel Co. to keep pace with distributers at other ports in adopting modern methods of unloading and distributing coal. The rapid unloading of the large cargoes, its reloading into cars for reshipment to interior points, its delivery to hundreds of teams for domestic distribution requires a vast amount of equipment and the book is therefore designed to acquaint the public with the physical capacity of the Milwaukee-Western Fuel Co.'s plant. The book is very beautifully enriched with halftone reproductions of the company's offices, both interior and exterior, and of its docks showing coal piles and unloading machinery. These docks include the Greenfield avenue dock, the Commerce street dock, the Cherry street dock, the Canal street dock, Kinnickinnic dock, both river and avenue fronts, the Pabst street dock, Sixteenth street dock, West dock and Canal street dock. These docks embrace also excellent views of the leading freighters of the lakes in process of unloading. Other views are given of the blacksmith, machine, harness and woodworkers' shops, together with the extensive stables of the company.

Incidentally the growth of the lake coal carrier is pictorially depicted, beginning with the steamer P. H. Birkhead, built in 1870, with a carrying capacity of 500 tons, and ending with the Legrand S. DeGraff with a carrying capacity of 12,441 tons. Anyone who receives this book may consider himself fortunate.

The new steamer W. R. Woodford, building at the West Bay City yard of the American Ship Building Co. for W. A. and A. H. Hawgood, of Cleveland, will be launched on Saturday next. The Woodford will be completed in about four weeks, after which time the yard at West Bay City will be closed for an indefinite period.

A bill has been favorably reported to the house of representatives appropriating $200,000 for the construction of a revenue cutter for use on Lake Superior.

DREDGING IN SHREWSBURY RIVER.

John & Joseph McSpirit, 118 Wayne street, Jersey City, N. J., were the only bidders for dredging in Shrewsbury river, New Jersey, bids being opened by Col. D. W. Lockwood, Army building, New York, April 7. Their bid was 28 cents per cu. yd.

DREDGING AT DULUTH.

Abstract of proposals received in response to advertisement for dredging, etc., and opened by Major Graham D. Fitch, Corps of Engineers, at Duluth, Minn., April 6, 1908. Amount proposed to be expended on this work about $30,000.

Name and address of bidder.	For dredging 100,000 cu. yds., more or less, from trench. Per cu. yd. measured in place.	For hire of dipper dredge with two dump scows, a steam tug, with crews and equipment, per hr. No. of bid.
1. Great Lakes Dredge & Dock Co., Chicago, Ill.	37c	$25.00
2. Northern Dredge & Dock Co., Duluth, Minn....	42c	24.00
3. Duluth - Superior Dredging Co., Duluth, Minn.	38c	35.00

Prices too high; recommended all be rejected.

The British barkentine Lovisa cleared last week for Rosario with a cargo of 820,916 ft. of lumber.

IMPROVEMENTS UPPER MISSISSIPPI RIVER.

Abstract of proposals received in response to advertisement dated Jan. 17, 1908, and opened by Major C. S. Riche, Corps of Engineers, at Rock Island, Ill., at 2 P. M., Feb. 17, 1908, for construction and repair of dams and shore protections on the upper Mississippi river (1) between Wisconsin river and Savanna, Ill., (2) between Rock Island, Ill., and Burlington, Iowa, and (3) between Burlington, Iowa, and Hannibal, Mo.

Contingent upon the passage of the sundry civil bill at the present session of congress, which will carry a provision of $500,000 for "Improving the Mississippi river from the mouth of the Missouri river to Minneapolis, Minn. Continuing improvement * * *," there will be available allotments made by project approved Jan. 13, 1908 (E. D. 65038/2), as follows:

1. Wisconsin river to Savanna	$ 40,000
2. Rock Island, Ill., to Burlington, Iowa	40,000
3. Burlington, Iowa, to Hannibal, Mo	40,000
Total	$120,000

From each of these three allotments there will be deducted the sum of $2,000 for superintendence and inspection, leaving net amount available for construction work in each section, $38,000.

Location of work and ratios of rock to brush in place.	Number of bid.	Name and address of bidder.	Rock per cubic yard.	Brush per cubic yard.	Average per cubic yard.	Total cubic yards material that can be placed under lowest bid.
Wisconsin river to Savanna, 1 rock to 2 brush.	1	Swift & Rust, St. Louis, Mo.	....	...	.....	.....
	2	A. V. Fetter, Quincy, Ill.	$1.50	53c	85 1/3c	
	3	Albert Kirchner, Fountain City, Wis.	1.52	51c	84 2/3c	
	4	A. J. Whitney, Rock Island, Ill....	1.47	47c	*80 1/3c	47,303.0
Rock Island to Burlington, 1 rock to 1 brush.	1	Swift & Rust, St. Louis, Mo.	1.55	58c	$1.065	
	2	A. V. Fetter, Quincy, Ill.	1.50	65c	1.075	
	3	Albert Kirchner, Fountain City, Wis.	1.47	59c	*1.03	36,893.2
	4	A. J. Whitney, Rock Island, Ill....	1.52	69c	1.105	
Burlington to Hannibal, 1 rock to 1 brush.	1	Swift & Rust, St. Louis, Mo.	....	...	.....	.....
	2	A. V. Fetter, Quincy, Ill.	1.50	55c	*1.025	37,073.2
	3	Albert Kirchner, Fountain City, Wis.	1.53	65c	1.09	
	4	A. J. Whitney, Rock Island, Ill....	1.55	69c	1.12	

*Recommended for acceptance.

TRADE NOTES.

The Lutcher & Moore Lumber Co., Orange, Texas, have just put out a calendar, the pictorial part of which is a view from their own forest. It is a reproduction of a photograph in bas relief and the great pine trees seem to stand out like actual trees when viewed in reasonable perspective.

The Baltimore Oakum Works is enlarging its plant nearly double its capacity. The large marine oakum business necessitated this and they are in shape to take care of the trade better than ever.

LOCKS AND DAMS, BLACK WARRIOR RIVER.

Abstract of proposals for building locks and dams, Nos. 14 and 15, Black Warrior river, Ala., and lock-tenders' houses, received in response to newspaper advertisement, and opened in the United States Engineer Office, Maj. H. Jervey, at Mobile, Ala., on Nov. 25, 1907:

	Dravo Contracting Co., Pittsburg, Pa.* Total.	Lane Brothers Co., Lynchburg, Va. Total.	Estimated. Total.
FOR LOCK NO. 14.			
Grubbing and clearing	$ 300.00	$ 300.00	$ 150.00
Common excavation	39,200.00	31,360.00	22,400.00
Rock excavation	11,550.00	9,570.00	13,200.00
Stone filling	9,225.00	10,701.00	5,535.00
Concrete	223,875.00	247,755.00	208,950.00
Riprap, hand placed	5,670.00	5,670.00	3,780.00
Miter sills	360.00	450.00	270.00
Framed timber, square edged, sound.	5,960.50	4,126.50	2,751.00
Framed timber, heart	6,328.00	4,520.00	3,164.00
Cofferdam timber	25,905.00	21,195.00	14,130.00
Sheathing	1,000.00	900.00	500.00
Placing valves and special irons	850.00	3,400.00	1,275.00
Contingencies, 5 per cent	.....	.....	13,805.00
Total	$330,223.50	$339,947.50	$289,910.00
FOR LOCK NO. 15.			
Grubbing and clearing	$ 300.00	$ 300.00	$ 150.00
Common excavation	32,410.00	25,928.00	18,520.00
Rock excavation	9,750.00	7,540.00	10,400.00
Stone filling	9,725.00	11,281.00	5,835.00
Concrete	265,485.00	281,575.00	225,260.00
Riprap, hand placed	6,150.00	6,150.00	4,100.00
Miter sills	360.00	450.00	270.00
Framed timber, square edged, sound.	6,695.00	4,738.00	3,090.00
Framed timber, heart	6,328.00	4,610.40	3,164.00
Cofferdam timber	21,120.00	16,192.00	10,560.00
Sheathing	1,000.00	920.00	500.00
Placing valves and special irons	850.00	3,400.00	1,275.00
Contingencies	.....	.....	14,156.00
Total	$360,173.00	$363,084.40	$297,280.00
Lock tender's house at No. 14	$ 3,000.00	$ 2,525.00	.....
Lock tender's house at No. 15	3,000.00	3,000.00	.....
RECAPITULATION.			
Total for Lock No. 14	$330,223.50	$339,947.50	$289,910.00
Total for Lock No. 15	360,173.00	363,084.40	297,280.00
	$690,396.50	$703,031.90	$587,190.00

*Contract awarded to Dravo Contracting Co.

DREDGING IN RARITAN BAY, N. J.

Abstract of proposals for dredging in Raritan Bay, N. J., received in response to advertisement dated March 10, 1908, opened at the Army building, New York City, on April 10, 1908, by Col. D. W. Lockwood, corps of engineers.

No. of bid.	Name and address of bidder.	Price bid per cu. yd. scow meas.
1.	R. G. Packard Co., 130 Pearl Street, New York City	28½c.
2.	The W. H. Beard Dredging Co., 21 State Street, New York City	25c.
*3.	P. Sanford Ross, Inc., 277 Washington Street, Jersey City, N. J.	20 9/10c.

*Recommended for acceptance.

BUILDING PIER AT WAUKEGAN.

Abstract of proposals for building pile pier, removing old pier, and dredging, at Waukegan harbor, Ill., received in response to advertisement dated March 20, 1908, and opened April 20, 1908, by Major W. V. Judson, Corps of Engineers, at Milwaukee, Wis.

Items.	Number of Proposal. Name and Residence of Bidder. 1. Greiling Bros., Green Bay, Wis.	2. Great Lakes Dock Co., Chicago, Ill.	3. Adolph Green, Dredge & Dock Co., Green Bay, Wis.
Driving round piles, furnished by the U. S.—13,400 lin. ft.—per linear foot	19½ cts.	22 cts.	18 cts.
Making and driving sheet piles, plank furnished by the U. S.—285,000 ft. B.M—per M. ft. B. M.	$19.50	$20.00	$19 25
Framing timber and plank furnished by U. S. for pile pier—150,000 ft. B. M.—per M. ft. B. M.	$21.50	$32.00	$24.50
2,500 tons stone, per ton of 2,000 lbs.	$ 1.75	$ 1.70	$ 1.68
Removing part of old pier—520 lin. ft.—per lineal foot	$22.00	$24.00	$14 60
Dredging 20,000 cu. yds., per cu. yd.	30 cts.	29 cts.	28 cts.
Total	$33,210.50	$35,978.00	*$28,965.25

*Lowest bid.

WIDENING ST. MARYS FALLS CANAL.

Abstract of proposals for widening St. Marys Falls Canal, received in response to advertisement dated Feb. 4, 1908, and opened March 5, 1908.

Name and address of bidders—	Excavation Class A. 135,000 cu. yds.	Excavation Class B. 360,000 cu. yds.	Channeling Rock. 85,000 sq. ft.	Framing Timber Cribs. 150,000 cu. ft.	Filling with Stone. 20,000 cu. yds.	Concrete. 7,000 cu. yds.	Special Concrete. 9,500 cu. yds.	Total of bid.
Great Lakes Dredge & Dock Co., Chicago, Ill.	$0.55	$1.30	$0.30	$0.10	$0.30	$4.00	$5.00	$664,250.00
P. B. McNaughton, Buffalo, N. Y.	0.52	1.30	0.35	0.16	0.40	4.40	6.40	691,550.00
MacArthur Bros. Co., Chicago, Ill.	0.58	1.30	0.30	0.20	0.75	4.60	5.80	704,100.00
Mason & Hanger Co., Richmond, Ky.	0.89	1.33	0.40	0.10	0.70	6.00	8.00	779,950.00

REPAIRS OF PIER AT FRANKFORT, MICH.

Abstract of bids for extension and repair of South pier at Frankfort, Mich., received and opened March 25, 1908, in accordance with advertisement dated Feb. 24, 1908, by Colonel M. B. Adams, Corps of Engineers.

——To furnish the following material and to secure it in the work——

Name and address of bidder—	Cutting down and removing old work, for lump sum of	Dredging for crib foundation, 100 cu. yds. Per cu. yd.	Foundation piles, 1,118 lin. ft. Per lin. ft.	Oak guard piles, 552 lin. ft. Per lin. ft.	Oak timber, 1,584 ft. b. m. M. ft. b. m. Per	Hemlock timber, 135,840 ft. b. m. Per M. ft. b. m. Per	White Norway or Southern pine or Douglas fir timber, 64,018 ft. b. m. Per M. ft. b. m. Per	White or Norway or Southern pine or Douglas fir planks for decking, 9,396 ft. b. m. Per M. ft. b. m. Per	Drift bolts, 228,658 pounds. Per pound.	Screw bolts, 3,346 lbs. Per lb.	Spikes, 634 pounds, Per lb.	Stone, 645 cords. Per cord.	Approximate total.
Burk, Smith & Nelson, Muskegon, Mich.	$ 500.00	50c	65c	60c	$60.00	$30.00	$42.00	$40.00	4c	4c	4c	$9.00	$15,713.26
Nelson J. Gaylord, Ludington, Mich.	1500.00	25c	65c	40c	60.00	32.00	40.00	36.25	4c	4c	4c	8.50	16,363.76
Columbian Cons. Co., Muskegon, Mich.	900.00	30c	70c	42c	65.00	32.50	43.00	42.00	4c	5c	5c	8.90	16,455.42
Robert Love, Muskegon, Mich.	2500.00	5c	80c	40c	65.00	32.00	43.00	40.00	4c	4c	4c	8.50	17,745.67

ADVERTISERS

The Star indicates alternate insertions, the Dagger once a month.

CLASSIFIED ADVERTISING SERVICE

STEAMERS FOR SALE.

FREIGHT AND PASSENGER steamer for sale, 500 gross tons. Allow 600 excursionists. Will sleep 75 night passengers. Address Box 123, THE MARINE REVIEW, Cleveland, O.

FLOATING CONCRETE PLANT For Sale, fully equipped with mixer, hoppers, revolving crane, etc. One 3-ton Whirley, equipped for handling clam-shell. One 400-foot cableway. One 25-ton Standard Gage Locomotive Crane with long boom. One Standard Gage Locomotive. For Sale by the Hunkin Brothers Construction Company, Cuyahoga Bldg., Cleveland, Ohio.

SMALL STEAMER FOR SALE. Carrying capacity about 275 tons. Makes between ten and eleven miles per hour; length 117 ft. overall, beam 24 ft., depth 8 ft. Rebuilt last fall; engine 18 x 20; boilers in first class condition. Derrick forward, lifting capacity between seven and ten tons. Entire new outfit on boat last fall. Would make a good sand sucker or could be used for contracting. Address Box 129, the MARINE REVIEW, Cleveland, Ohio.

FOR SALE, MISCELLANEOUS.

NEAFIE & LEVY F & A COMpound 26"-50" x 30" with Surface Condenser and Pumps. Will alter to 22"-50" x 30" for high steam.

13½ K. W. Electric Lighting Set.

Williamson Steering Engine.

Two Hawser Pullers (Capstans).

Two Providence Steam Windlasses.

Wheeler Surface Condenser.

Blake Vertical Duplex Air Pump and Jet Condenser. 7½" steam, 16" air, 12" stroke.

Worthington Duplex Air Pump & Jet Condenser 9" x 12" x 10".

D. C. Sturtevant Blower & Engine.

Two Scotch Boilers 12' x 12'.

Two Scotch Boilers 11' x 12'.

Two Scotch boilers 13½' x 12'.

MARVIN BRIGGS, INC.,
154 Nassau Street, New York.

TUG FOR SALE

TUG "J. J. EVANS" FOR SALE, in first-class condition. Rebuilt, November, 1907, hull of oak, 45 feet keel length, 12 feet beam, 6 feet depth, 14 gross tons, high pressure Sutton engine, cylinder 14 x 14 inches, fire box boiler, 5 x 9½ feet, 100 lbs. steam. Can be seen at Two Rivers, Wis. Address Hamilton Mfg. Co., Two Rivers, Wis.

FOR SALE. TWO SCOTCH MArine Boilers built in 1895; diameter 16 ft., length 11 ft., with one set new tubes for boilers; corrugated furnaces renewed one year ago. Also one upright boiler, diameter 30 in., height 5½ ft., built in 1898. Further information furnished on application. Address U. S. Engineer Office, Galveston, Tex.

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Advertisements can be found readily by reference to the Alphabetical Index.

AIR COMPRESSION, HOISTS.
Great Lakes Engineering Works.. .....Detroit.

AIR PUMPS AND APPLIANCES.
Fore River Ship & Engine Co..... ..... Quincy, Mass.
Great Lakes Engineering Works... ..... Detroit.

ANCHORS.
Admiral Anchor Co.....Chester, Pa.
Bowers, L. M. & Co..... ..... Binghamton, N. Y.

ANTI-FRICTION METALS.
Cramp, Wm. & Sons...Philadelphia.

ANTI-RUST COATINGS.
Hardy Paint & Varnish Co..... .....Toledo, O.

ARTIFICIAL DRAFT FOR BOILERS.
American Ship Building Co..... ..... Cleveland.
Detroit Ship Building Co...Detroit.
Great Lakes Engineering Works... ..... Detroit.

ASH EJECTORS.
Great Lake Engineering Works.... ..... Detroit.

ATTORNEYS AND PROCTORS IN ADMIRALTY.
Gilchrist, Albert J.....Cleveland.
Goulder, Holding & Masten..... ..... Cleveland.
Hyner, P. D.....Erie, Pa.
Hoyt, Dustin & Kelley...Cleveland.
Jenkins, Russell & Eichelberger.... ..... Cleveland.
Kremer, C. E.....Chicago.
MacDonald, Ray G.....Chicago.
Marshall, Alexander..Duluth, Minn.
Shaw, Warren, Cady & Oakes..... ..... Detroit.

BAROMETERS, MARINE GLASSES, ETC.
Ritchie, E. S. & Sons..... .....Brookline, Mass.

BLOCKS, SHEAVES, ETC.
Boston Lockport Block Co..... ..... Boston, Mass.

BOAT BUILDERS.
Drein, Thos., & Son..... .....Wilmington, Del.
Truscott Boat Mfg. Co..... .....St. Joseph, Mich.

BOILER COMPOUNDS.
Bird-Archer Co.....New York.

BOILER MANUFACTURERS.
Almy Water Tube Boiler Co..... .....Providence, R. I.
American Ship Building Co..... ..... Cleveland.
Atlantic Works.....East Boston, Mass
Briggs, Marvin.....New York.
Chicago Ship Building Co.....Chicago
Copeland Co., E. T.....New York.
(Copeland Scotch Improved.)
Cramp, Wm. & Sons..Philadelphia.
Delany, P. & Co...Newburgh, N. Y.
Detroit Ship Building Co..Detroit.
Fletcher, W. A. & Co..... .....Hoboken, N. J.
Fore River Shipbuilding Co..... .....Quincy, Mass.
Great Lakes Engineering Works... ..... Detroit.
Kingsford Foundry & Machine Works.....Oswego, N. Y.
Maryland Steel Co..... .....Sparrow's Point, Md.
Marine Iron Works.....Chicago.
Milwaukee Dry Dock Co..... ..... Milwaukee.
New York Shipbuilding Co..... .....Camden, N. J.
Quintard Iron Works Co..... .....New York.
Roberts Safety Water Tube Boiler Co..... New York.
Superior Ship Building Co..... .....Superior, Wis.
Toledo Ship Building Co....Toledo.

BOILER STAYBOLTS, IRON OR STEEL, HOLLOW OR SOLID.
Falls Hollow Staybolt Co..... .....Cuyahoga Falls, O.

BRASS GOODS.
Michigan Lubricator Co.....Detroit.
Penberthy Injector Co..... .....Detroit, Mich.

BRASS AND BRONZE CASTINGS.
Cramp, Wm. & Sons...Philadelphia.
Fore River Ship & Engine Co..... .....Quincy, Mass.
Great Lakes Engineering Works... ..... Detroit.

BRIDGES, BUILDERS OF
Scherzer Rolling Lift Bridge Co.... ..... Chicago.

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Martin-Barriss Co.....Cleveland.

CABLE GREASE.
U. S. Graphite Co., Saginaw, Mich.

CANVAS SPECIALTIES.
Baker & Co., H. H.....Buffalo.
Upson-Walton Co.....Cleveland.

CAPSTANS.
American Ship Windlass Co..... .....Providence, R. I.
Dake Engine Co..... .....Grand Haven, Mich.
Hyde Windlass Co.....Bath, Me.
Marine Iron Wks.....Chicago, Ill.

CASTINGS (Brass and Bronze).
Griscom-Spencer Co., New York City.

CASTINGS (Steel).
Otis Steel Co.....Cleveland.

CEMENT, IRON FOR REPAIRING LEAKS.
Smooth-On Mfg. Co..... .....Jersey City, N. J.

CHAIN CONVEYORS, HOISTS.
Brown-Hoisting Machinery Co..... .....Cleveland, O.
General Electric Co..... .....Schenectady, N. Y.

CHAINS.
Seneca Chain Co.....Kent, O.

CHAIN HOISTS.
Boston & Lockport Block Co..... ..... Boston, Mass.

CHARTS.
Penton Publishing Co.....Cleveland.

CIRCULATORS (Automatic.)
Copeland Co., E. T.....New York.

CLOCKS (Marine and Ship's Bell) AND CHRONOMETERS.
Ritchie, E. S. & Sons..... .....Brookline, Mass.

COAL PRODUCERS AND SHIPPERS.
Hanna, M. A. & Co.....Cleveland.
Lorain Coal & Dock Co..... ..... Cleveland.
Pickands, Mather & Co...Cleveland.
Pittsburg Coal Co.....Cleveland.
Toledo Fuel Co.....Toledo, O.

COAL AND ORE HANDLING MACHINERY.
Brown-Hoisting Machinery Co..... .....Cleveland.

COMPASSES.
Ritchie, E. S. & Son..... .....Brookline, Mass.

COMPOUNDS—LUBRICATING.
Cook's Sons, Adam .New York City.

CONDENSERS.
Great Lakes Engineering Works... ..... Detroit.
Wheeler Condenser & Engineering Co. .....New York.

CONTRACTORS FOR PUBLIC WORKS.
Breymann Bros., G. H.....Toledo.
Buffalo Dredging Co.....Buffalo.
Dunbar & Sullivan Dredging Co.... .....Buffalo.
Griscom-Spencer Co., New York City.
Great Lakes Dredge & Dock Co.... ..... Chicago.
Starke Dredge & Dock Co., C. H... ..... Milwaukee.
Sullivan, M. .....Buffalo.

CONVEYORS (Portable).
Spence Mfg. Co.....St. Paul, Minn.

CORDAGE.
Baker & Co., H. H.....Buffalo.
Great Lakes Supply Co..... .....Buffalo and Duluth.
Columbian Rope Co...Auburn, N. Y.
Samson Cordage Works. Boston, Mass.
Upson-Walton Co.....Cleveland.